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RIEHLE BROS.  
TESTING MACHINE CO



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*Richle Bros. Testing Machine Co.*

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*Riehle Bros. Testing Machine Co.*

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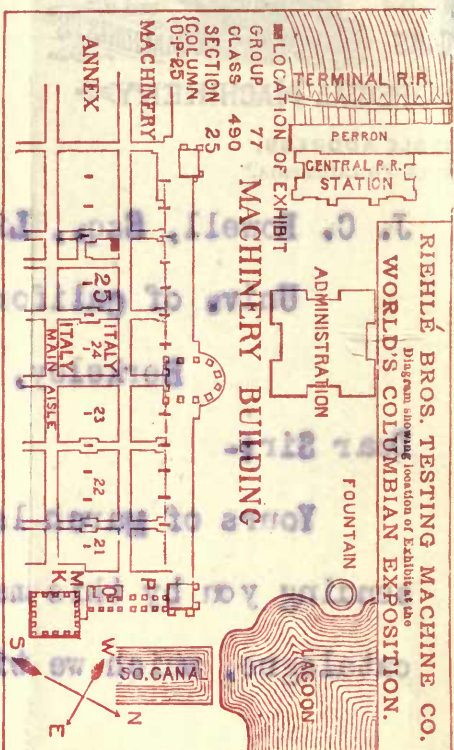












The following is a list of articles that will be exhibited by  
Riehle Bros. Testing Machine Co. in working order:

- One 300,000 lb. Vertical Screw Power Testing Machine, with patented Automatic Screw Beam, Plate No. 178.  
One 200,000 lb. Horizontal Car Coupler, Link, and Chain Testing Machine, Plate No. 22.  
One 200,000 lb. Vertical Screw Power Testing Machine, Plate No. 154.  
One 100,000 lb. Vertical Screw Power Testing Machine with Automatic Beam, Plate No. 34.  
One 80,000 lb. Spring Testing Machine, Plate No. 210.  
One 20,000 lb. Vertical Screw Power Testing Machine with Vernier Poise, Plate No. 153.  
One 20,000 lb. Horizontal Band Tester, Plate No. 10.  
One 5000 lb. Transverse Testing Machine, Plate No. 13.  
One 3000 lb. Transverse Testing Machine, Plate No. 26.  
One 5000 lb. Torsional Testing Machine, Plate No. 159.  
One 1000 lb. Cement Testing Machine, style A, with Worm Gear and Rubber Tipped Grips, Plate No. 14.  
One 500 lb. Cloth Testing Machine, Plate No. 25.  
One 200 lb. Cloth Testing Machine, Plate No. 189.  
One Marble Molding and Countersinking Machine, Plate No. 190.  
Also many smaller Testing Machines and special appliances connected with the Testing of Materials.

**This Exhibit is in charge of Mr. J. R. MATLACK, Jr., Member of Society of Mechanical Engineers.**

**Tests of material will be made during the Exposition.**

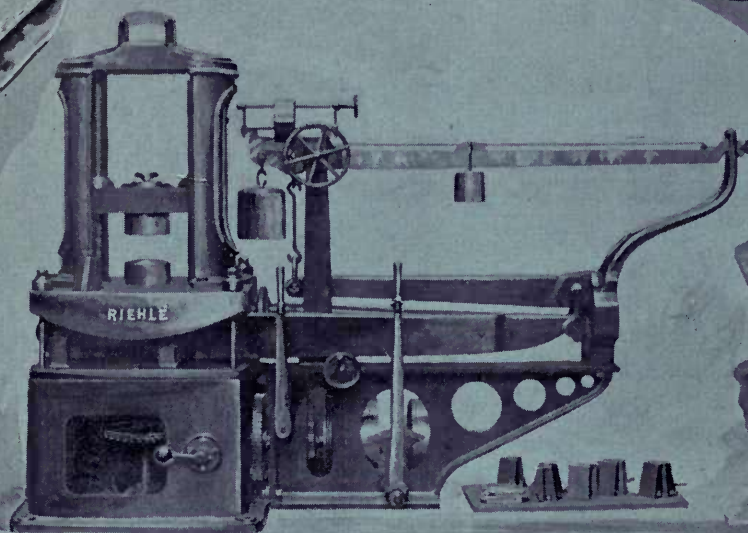
A special Exhibit of  
One 200,000 lb. Vertical Screw Power Testing Machine in the Government Building,  
Bureau of Ordnance, Also,  
One 200 lb. Cloth Testing Machine in Government Building, Quartermaster's  
Department.



VOLUMES 1 and 2.

CATALOGUE No 3

RIEHLÉ BROS.  
Testing Machine Co.



PHILADELPHIA, PA.  
U.S.A.



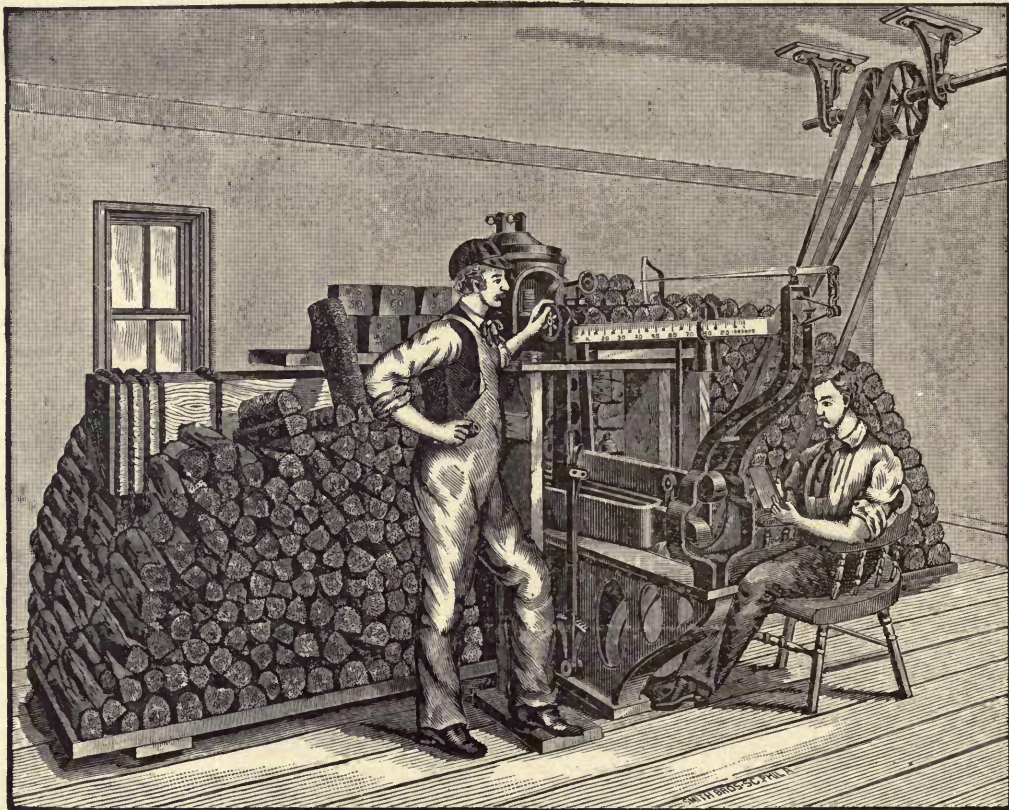
## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

Article appearing in *The Crank*, May, 1891. *The Crank* is a monthly journal issued by the Cornell University.

# STANDARDIZING A RIEHLÉ 100,000 Lbs. U. S. STANDARD TESTING MACHINE.

Among the testing machines of various sizes and kinds employed in the Mechanical Laboratory of Sibley College are two or three Riehlé machines, including one of 100,000 and one of 200,000 lbs. capacity. The standardization of machines of such magnitude is a matter of such serious difficulty that it is rarely attempted by direct comparison with standard weights (U. S.). The usual process with the larger machines is first to standardize up to some convenient weight, then, loading the machine by a pull on a test-piece of large size up to the point thus reached, add weights of standard or standardized magnitude up to some convenient higher figure, next removing as before, and straining up to the new limit by a pull on the test-piece, then once more adding weights, until finally the limit of the proposed test is reached. Direct loading up to 50 or 100 tons is, perhaps, unknown. It has, however, been done here, and our illustration is made from a photograph taken while the machine was thus loaded to its maximum rated figure.

This work was undertaken by Messrs. Lombard and Van Everen during the earlier part of the year, in the time



appropriated to the standardization of the various apparatus of the laboratory, and occupied a full day and a night of continuous labor. The photograph exhibits the method of procedure. (The figures in the picture are not likenesses.) The machine was prepared for the loads by laying across its lower platform a heavy beam, 12 inches square and about 10 feet long, in such a manner that platforms for carrying the enormous mass of iron to be used could be suspended from its ends, and just clear of the floor, so that a break-down should not cause disaster. A carefully-standardized platform-scale of moderate size was placed beside the machine, and the loads of pig-iron, supplied by the foundry-stockyard, were, increment by increment, compared with the U. S. standard weights, of which the laboratory possesses some thousands of pounds, and then were added to the load on the machine. The comparison of weight indicated by the scale-beam of the testing machine with the weights added were made at first, at short intervals, and later by increments of 500 pounds. The maximum being reached, the same method was adopted as the load was removed, and the ascending was compared with the descending scale. The log thus obtained was then plotted, and the curves so produced were studied to determine the magnitude and the law of variation of errors.

During the process of loading, the floor, a concrete and gravel foundation, gave way under the tremendous pressure at the weighted end of the machine, and this interfered slightly with operations at that point. This effect was eliminated, however, and the results were very satisfactory. The machine was found to be correct to within a small fraction of one per cent. of its readings, and the error practically constant. So far as irregular, it was, probably, mainly due to slight variations in the divisions in the scale-beam. The college is very fortunate in the possession of such accurate machines, and this particular machine is as handsome and neatly made as it is accurate.



ILLUSTRATED  
CATALOGUE No. 3.

CABLE ADDRESS:  
RIEHLÉ, PHILADELPHIA, U. S. A.

EACH ARTICLE HAS A TELEGRAPH NAME, AND THE  
CODE ON PAGE 2 WILL ENABLE CUSTOMERS  
TO ORDER BY WIRE WITH FACILITY.

IN 2 VOLS.—VOL. 1.

RIEHLÉ BROS.  
TESTING MACHINE CO.

CONTAINING DESCRIPTIONS OF

Riehlé U. S. Standard Patented Testing Machines,  
With the various appliances used with same.

Riehlé Standard Marble Molding and Countersink-  
ing Machines,

And other marble-working tools.

Riehlé-Robie Patent Ball-bearing Screw Jacks.

Pig Metal Trucks and Turn-Tables.

Power Hay and Straw Rope Twisters, Etc.

Hydraulic Pumps and Presses and Special Machinery

Railroad and Warehouse Trucks, Etc.

THE RIEHLÉ TESTING MACHINES are of *original design and finest construction*, and are "*the Standard of the World.*"  
The levers and weighing parts are tested and adapted to the U. S. Standard furnished us by the U. S. Government,  
Washington, D. C., and can be adjusted to the standard of any nation, if desired. Tests of materials made  
daily and certificates furnished. Reports recorded and kept confidential. Riehlé Bros. Testing  
Machine Co. have their own Draughting and Designing Room, Pattern and Machine Shops,  
and Foundry, which enables them to secure original designs and the best results.

—❖— ENGINEERS, IRON FOUNDERS AND GENERAL MACHINISTS —❖—

DESIGNERS AND CONSTRUCTORS OF

SPECIAL MACHINERY.

Tests of Materials made daily and Certificates Furnished. Reports recorded and kept Confidential.



SPECIAL APPENDIX OF

"SUPPLY DEPARTMENT."

In Vol. 2.

Works, Ninth St. above Master  
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PHILADELPHIA, PA., U. S. A.

NEW YORK OFFICE, 93 LIBERTY STREET  
CHICAGO AGENCY,  
R. W. HUNT & CO., BUREAU OF TESTS,  
THE ROOKERY.



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Each Article Has a Telegraph Name.

59499

TELEGRAPH CODE.

Please send as soon as possible by telegraph, . . . . .	AGINCOURT.
“ “ “ “ mail, . . . . .	ADVANCE.
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RIEHLÉ BROS. TESTING MACHINE CO.

Own the following valuable United States Letters-Patent, and are the sole makers of Testing Machines and other articles covered by same.

These patents embody all the important features in all the latest improved machines and appliances.

Vertical Screw-Power Testing Machines, . . . . .	Date of Patent, . . . . .	July 2, 1889.
Vernier Poise for Beam, . . . . .	“ “ . . . . .	August 16, 1887.
Riehlé High Faced Wedge Grip, . . . . .	“ “ . . . . .	November 8, 1881.
Riehlé-Gray Automatic Weighing and Recording Attachment, . . . . .	Patent Pending.	
Riehlé-Sloane Micrometer Caliper, . . . . .	Date of Patent, . . . . .	July 7, 1891.
Other Patents Pending.		
Riehlé-Buzby Automatic Electric Beam for Testing Machine, . . . . .	Patent Pending.	
Riehlé-Reeser Automatic Electric Beam for Testing Machine, . . . . .	Date of Patent, . . . . .	March 21, 1893.
Spring Testing Machine, . . . . .	Patent Pending.	
Marble Molding and Countersinking Machine, . . . . .	Date of Patent, . . . . .	September 14, 1886.
“ “ “ “ “ “ . . . . .	“ “ . . . . .	May 17, 1887.
Riehlé-Hatcher Marble Molding Cutter, . . . . .	“ “ . . . . .	December 3, 1889.
Riehlé-Robie Ball Bearing Screw Jack, . . . . .	“ “ . . . . .	September 21, 1886.
“ “ “ “ “ “ . . . . .	“ “ . . . . .	October 20, 1891.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Names and Addresses of Parties Using the Riehlé U. S. Standard Testing Machines.

### PARAGRAPH 1.

#### UNITED STATES GOVERNMENT.

<i>U. S. Standard Testing Machines.</i>		<i>Capacity Lbs.</i>	
U. S. Navy Yard (Bu. of Equip.)	Boston, Mass.,	400,000	T. Mach.
"	"	200,000	"
"	"	10,000	"
"	"	4,000	Wire T.
U. S. Engineers Office,	"	1,000	Cement T.
U. S. (Light-house Board),	"	1,000	"
U. S. (Supv. Insp. St. Vess.),	Buffalo, N. Y.,	40,000	T. Mach.
U. S. Engineers Office,	"	1,000	Cement T.
U. S. Navy Yard (Bu. of Con.),	Brooklyn, "	100,000	T. Mach.
U. S. Navy Yd. (Insp. of Cloth),	"	500	Cloth T.
U. S. Military Academy,	West Point, "	1,000	Cement T.
U. S. Gov't (Bu. Indus. Aff.),	New York, "	500	Cloth T.
U. S. (Supv. Insp. St. Vess.),	Baltimore, Md.,	40,000	T. Mach.
U. S. Naval Academy,	Annapolis, "	100,000	"
"	"	20,000	"
"	"	1,000	Cement T.
"	"	Riehlé-Jacobi Extensio.	
"	"	Riehlé-Brooklyn Extensio.	
Qrtm. Dept. Schuylkill Arsenal,	Philadelphia, Pa. (4),	200	Cloth T.
U. S. Navy Yard (League Is.),	"	1,000	Cement T.
U. S. Engineers Office,	Ft. Delaware, Del.,	1,000	"
U. S. (Supv. Insp. St. Vess.),	Pittsburgh, Pa.,	40,000	T. Mach.
U. S. Arsenal,	Washington, D. C.,	1,000	Canvas T.
U. S. Engineers Office,	"	1,000	Cement T.
U. S. Insp. of Cements,	"	1,000	"
U. S. Treas. Dep't (Architect),	"	1,000	"
U. S. Engineers Office (Acq.),	"	1,000	"
U. S. Com.,	District of Colum.,	1,000	"
U. S. (Supv. Insp. St. Vess.),	Wheeling, W. Va.,	50,000	T. Mach.
U. S. Engineers Office,	Charleston, "	1,000	Cement T.
U. S. Navy Yard,	Portsmouth, Va.,	50,000	T. Mach.
"	"	1,000	Cement T.
"	N. H.,	1,000	"
U. S. Engineers Office,	Ft. Monroe, Va.,	1,000	"
U. S. (Supv. Insp. St. Vess.),	Cincinnati, Ohio,	40,000	T. Mach.
"	Detroit, Mich.,	40,000	"
U. S. Engineers Office,	Sault St. Marie, "	1,000	Cement T.
U. S. (Supv. Insp. St. Vess.),	St. Paul, Minn.,	50,000	T. Mach.
U. S. Arsenal,	Rock Island, Ind.,	1,000	Cement T.
U. S. (Supv. St. Vess.),	Louisville, Ky.,	40,000	T. Mach.
"	St. Louis, Mo.,	40,000	"
"	San Francisco, Cal.,	40,000	"
U. S. Navy Yard (Bu. of St. Eng.),	Mare Island, "	60,000	"
U. S. (Supv. Insp. St. Vess.),	New Orleans, La.,	40,000	"

#### FOREIGN GOVERNMENTS.

Russian Government,	100,000	T. Mach.
"	5,000	Tors. T.
Brazilian	60,000	T. Mach.
"	5,000	Tors. T.
"	2,000	Cement T.
"	500	Cloth T.
"	100	Paper T.
"	100	Twine T.
Japanese	50,000	T. Mach.

### PARAGRAPH 2.

#### IRON AND STEEL WORKS.

Siemen Bros., Landore Steel Works,	England,	20,000	T. Mach.
Jere Abbot & Co., for export to Sweden,	Sweden,	50,000	"
C. J. A. Dick,	Christiania, Norway,	50,000	"
Portland Rolling Mill Co.,	Portland, Me.,	40,000	"
Naylor & Co.,	Boston, Mass.,	50,000	"
Union Iron Works Co.,	Buffalo, N. Y.,	40,000	"
Gould St. Forge Co.,	"	200,000	"
Burden Iron Works,	Troy, "	200,000	"
"	"	Riehlé-Yale Ex.	
Bethlehem Iron & Steel Co.,	Bethlehem, Pa.,	150,000	T. Mach.
"	"	100,000	"
Logan Iron & Steel Co.,	Logan, "	100,000	"
W. W. Kurtz & Co.,	Coatesville, "	50,000	"
Coatesville Iron Co.,	"	40,000	"

#### *U. S. Standard Testing Machines.*

		<i>Capacity Lbs.</i>	
Phila. & Read. C. & I. Co.,	Reading, Pa.,	30,000	T. Mach.
Reading Iron Works,	"	30,000	"
Phoenix Iron Co.,	Phoenixville, "	150,000	"
Pottsville I. & S. Co.,	Pottsville, "	100,000	"
Midvale Steel Works,	Nicet'n, Phila.,	200,000	"
Standard Steel Casting Co.,	Thurlow, "	100,000	"
Chester Rolling Mill Co.,	"	100,000	"
Portage Iron Co.,	Duncansville, "	20,000	"
N. Branch Steel Co.,	Danville, "	50,000	"
Singer, Nimick & Co.,	Pittsburgh, "	40,000	"
Howe, Brown & Co.,	"	50,000	"
Phillips, Nimick & Co.,	"	40,000	"
Wayne Iron & Steel Co.,	"	30,000	"
Pittsburgh Bessemer Co.,	"	50,000	"
Graff, Bennett & Co.,	"	100,000	"
"	"	50,000	"
Anderson, Dupuy & Co.,	"	150,000	"
"	"	20,000	"
Carbon Iron Co.,	"	100,000	"
Pittsburgh Forge & Iron Co.,	"	200,000	"
Carnegie, Phipps & Co.,	"	200,000	"
P. L. Kimberly & Co.,	Sharon, "	20,000	"
Eureka Cast S. Co.,	Chester, "	100,000	"
Norristown Steel Co.,	Norristown, "	100,000	"
Trenton Iron & Steel Co.,	Trenton, N. J.,	100,000	"
Trenton Mall. Iron Co.,	"	50,000	"
Passaic Rolling Mill Co.,	Paterson, "	100,000	"
Youngstown I. & S. Co.,	Warren, Ohio,	100,000	"
Andrews Bros. & Co.,	Youngstown, "	100,000	"
Youngstown I. & S. Co.,	"	20,000	"
Cartwright, McCurdy & Co.,	"	20,000	"
Swift Iron & Steel Works,	Cincinnati, "	40,000	"
Phillips & Jordan,	"	40,000	"
Ironton Rolling Mill Co.,	Ironton, "	40,000	"
Burgess Iron & Steel Works,	Portsmouth, "	30,000	"
Gaylord Rolling Mill Co.,	"	150,000	"
Solid Steel Co.,	Alliance, "	50,000	"
Britton Iron & Steel Co.,	Cleveland, "	40,000	"
Springfield Iron Co.,	Springfield, Ill.,	120,000	"
Wyandotte Rolling Mill,	Wyandotte, "	150,000	"
Vulcan Iron Works,	Chicago, "	20,000	"
Chicago Tire & Spring Co.,	Chicago, "	200,000	"
Helmbacher Forge R. M.,	St. Louis, Mo.,	150,000	"
West Superior I. & S.,	West Superior, Wis.,	5,000	Trans. T.
Decatur Rolling Mill,	Decatur, Ala.,	5,000	"
Eureka Iron Co.,	Detroit, Mich.,	40,000	T. Mach.
"	"	150,000	"
Indiana Steel Co.,	Indianapolis, Ind.,	100,000	"
Eberhart Mfg. Co.,	Cleveland, Ohio,	40,000	"

### PARAGRAPH 3.

#### CHAIN MANUFACTURERS AND BOILER-MAKERS.

Bradlee & Co.,	Philadelphia, Pa.,	300,000	Chain T.
Baker C. & W. I. Co.,	Beaver Falls, "	200,000	"
Carlisle Ch. Works,	Carlisle, "	50,000	"
Lebanon Chain Works,	Lebanon, "	300,000	"
Jeffries Mfg. Co.,	Columbus, Ohio,	50,000	"
P. Hayden Sad. H. Co.,	"	100,000	"
"	"	50,000	"
McIlvain & Spiegel Boiler Co.,	Cincinnati, "	40,000	T. Mach.
Rixdorf-Krein Mfg. Co.,	St. Louis, Mo.,	100,000	Chain T.
Indianapolis Ch. & S. Co.,	Indianapolis, Ind.,	20,000	Hor. T M.
Ewart Mfg. Co.,	"	50,000	Chain T.

### PARAGRAPH 4.

#### RAILROAD COMPANIES.

Penna. R. R. Co.,	Altoona, Pa.,	100,000	T. Mach.
"	"	25,000	Spring T.
"	"	Riehlé-Yale Extensio.	
"	"	75,000	T. Mach.
Northern Central R. R. Co.,	York, Pa.,	1,000	Cement T.
Eastern R. R. Asso.,	(P.H. Dudley L.C.)	4,000	T. Mach.
Lehigh Valley R. R.,	Batavia, N. Y.,	1,000	Cement T.
N. Y. C. & H. R. R.,	"	300	"



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

<i>U. S. Standard Testing Machines.</i>			<i>Capacity</i>	
			<i>Lbs.</i>	
Baltimore & Ohio R. R., . . .	Baltimore, Md.,	100,000	T. Mach.	
" " " " " "	" " " "	40,000	Spring T.	
" " " " " "	" " " "	1,000	Cement T.	
Norfolk & Western R. R., . . .	Roanoke, Va.,	100,000	T. Mach.	
Illinois Central R. R., . . .	Cairo, Ill.,	1,000	Cement T.	
" " " " " "	Chicago, Minn.,	5,000	T. Mach.	
Northern Pacific R. R., . . .	Brainerd, Minn.,	2,000	Cement T.	
" " " " " "	Albina, Ore.,	1,000	"	
Great Northern R'y, . . .	St. Paul, Minn.,	200,000	T. Mach.	
" " " " " "	" " " "	65,000	Spring T.	
" " " " " "	" " " "	20,000	Oil Test.	
" " " " " "	" " " "	"	Riehle-Yale Ex.	
Missouri Pacific R'y (2), . . .	St. Louis, Mo.,	1,000	Cement T.	
" " " " " "	" " " "	1,000	"	
Union Pacific R'y, . . .	Omaha, Neb.,	200,000	T. Mach.	
" " " " " "	" " " "	4,000	Tors. T.	
" " " " " "	" " " "	1,000	Cement T.	
A. T. & Santa Fé R. R. Co., . . .	Topeka, Kan.,	40,000	Spring T.	
Q. M. O. & O. R. R. Co., . . .	Montreal, Canada,	4,000	Cement T.	
Grand Trunk R'y, . . .	" " " "	10,000	Spring T.	
Canadian Pacific R'y Co., . . .	" " " "	5,000	Trans. T.	

## PARAGRAPH 5.

### LIST OF COLLEGES AND UNIVERSITIES.

Harvard University, . . .	Boston, Mass.,	60,000	T. Mach.	
" " " " " "	" " " "	1,000	Cement T.	
Mass. Inst. Technology, . . .	" " " "	1,000	"	
" " " " " "	" " " "	40,000	T. Mach.	
Worcester University, . . .	Worcester, " "	1,000	Cement T.	
" " " " " "	" " " "	5,000	Tors. T.	
University of Vermont, . . .	Burlington, Vt.,	50,000	T. Mach.	
" " " " " "	" " " "	2,000	Cement T.	
Cornell University, . . .	Ithaca, N. Y.,	200,000	T. Mach.	
" " " " " "	" " " "	100,000	"	
" " " " " "	" " " "	40,000	"	
" " " " " "	" " " "	2—50,000	"	
" " " " " "	" " " "	1,000	Cement T.	
U. S. Mil. Acad. (in Gov. List),	West Point, " "	1,000	"	
Columbia School of Mines, . . .	New York, " "	1,000	"	
Stevens Institute, . . .	Hoboken, N. J.,	40,000	T. Mach.	
Princeton College, . . .	Princeton, " "	2,000	Cement T.	
State College of Pennsylvania,	State College, Pa.,	100,000	T. Mach.	
" " " " " "	" " " "	5,000	Tors. T.	
" " " " " "	" " " "	2,000	Cement T.	
" " " " " "	" " " "	"	Riehle-Marshall Ex.	
Western Univ. of Penna., . . .	Allegheny, Pa.,	100,000	T. Mach.	
" " " " " "	" " " "	1,000	Cement T.	
" " " " " "	" " " "	"	Brooklyn Exten.	
Yale Coll. (Sheffield Sci. Sch.),	New Haven, Conn.,	100,000	T. Mach.	
" " " " " "	" " " "	2,000	Cement T.	
" " " " " "	" " " "	2,000	Trans. T.	
" " " " " "	" " " "	"	1-Riehle-Yale Ex.	
U. S. Naval Acad. (in Gov. List),	Annapolis, Md.,	100,000	T. Mach.	
" " " " " "	" " " "	20,000	"	
" " " " " "	" " " "	2,000	Cement T.	
" " " " " "	" " " "	"	Riehle-Brooklyn Exten.	
" " " " " "	" " " "	"	Riehle-Jacobi	
University of Georgia, . . .	Athens, Ga.,	40,000	T. Mach.	
Polytechnic Institute, . . .	Auburn, Ala.,	35,000	"	
Univ. of West Virginia, . . .	Morgantown, W. Va.,	40,000	"	
University of Texas, . . .	Austin, Tex.,	10,000	"	
Agric. State College of Texas,	College Station, " "	20,000	"	
" " " " " "	" " " "	1,000	Cement T.	
Vanderbilt University, . . .	Nashville, Tenn.,	40,000	T. Mach.	
" " " " " "	" " " "	1,000	Cement T.	
State Agr. & Mech. Col. of Ohio,	Columbus, Ohio,	40,000	T. Mach.	
Case School of App. Science, . . .	Cleveland, " "	60,000	"	
Univ. of Cincinnati, . . .	Cincinnati, " "	2,000	Cement T.	
Arkansas Industrial Univ., . . .	Fayetteville, Ark.,	60,000	T. Mach.	
" " " " " "	" " " "	2,000	Cement T.	
" " " " " "	" " " "	"	Riehle-Yale Ex.	
Rose Poly. Inst. Tech., . . .	Terre Haute, Ind.,	100,000	T. Mach.	
University of Illinois, . . .	Champaign, Ill.,	100,000	"	
" " " " " "	" " " "	1,000	Cement T.	
Washington University, . . .	St. Louis, Mo.,	100,000	T. Mach.	
Michigan School of Mines, . . .	Houghton, Mich.,	100,000	"	
Regents of Univ. of Wisconsin,	Madison, Wis.,	1,000	Cement T.	
" " " " " "	" " " "	5,000	Trans. T.	

<i>U. S. Standard Testing Machines.</i>			<i>Capacity</i>	
			<i>Lbs.</i>	
University of Iowa, . . .	Iowa City, Iowa,	100,000	T. Mach.	
" " " " " "	" " " "	1,000	Cement T.	
Univ. of Minneapolis, . . .	Minneapolis, Minn.,	1,000	"	
Nebraska State University, . . .	Lincoln, Neb.,	2,000	"	
University of Colorado, . . .	Fort Collins, Col.,	50,000	T. Mach.	
State School of Mines, . . .	Golden, " "	100,000	"	
" " " " " "	" " " "	"	Riehle-Buzby Ex.	
University of California, . . .	Berkley, Cal.,	50,000	"	
" " " " " "	" " " "	1,000	Cement T.	
" " " " " "	" " " "	5,000	Tors. T.	
" " " " " "	" " " "	"	Riehle-Yale Ex.	
Leland Stanford, Jr., University,	Oakland, " "	1,000	Cement T.	
School of Practical Sciences, . . .	Toronto, Canada,	200,000	T. Mach.	
" " " " " "	" " " "	2,000	Cement T.	
" " " " " "	" " " "	20,000	Oil Test.	
McGill University, . . .	Montreal, " "	2,000	Cement T.	
" " " " " "	" " " "	"	Riehle-Yale Ex.	
Univ. of Tokio (in Gov. List), . . .	Tokio, Japan,	40,000	T. Mach.	
Univ. of Sidney, . . .	New South Wales, Aus.,	Riehle-Yale Ex.		

## PARAGRAPH 6.

### IRON FOUNDRIES AND MACHINISTS.

Wood, Bishop & Co., . . .	Portland, Me.,	5,000	Trans. T.	
Holyoke Machine Co., . . .	Holyoke, Mass.,	50,000	T. Mach.	
Atherton Mach. Co., . . .	Lowell, " "	5,000	Trans. T.	
Pawtucket Mfg. Co., . . .	Pawtucket, R. I.,	50,000	T. Mach.	
Fales & Jenks, . . .	Providence, " "	2,500	Trans. T.	
Corliss Steam Engine Co., . . .	" " " "	40,000	T. Mach.	
Farrel Foundry & Machine Co.,	Ansonia, Conn.,	50,000	"	
Farrel Machine Co., . . .	" " " "	4,000	Trans. T.	
Chas. Parker & Co., . . .	Meriden, " "	3,000	"	
Stanley Works, . . .	New Britain, " "	20,000	T. Mach.	
Lincoln Iron Works, . . .	Rutland, Vt.,	3,000	Trans. T.	
Economy Foundry Co., . . .	Syracuse, N. Y.,	3,000	"	
Russel Wheeler & Son, . . .	Utica, " "	3,000	"	
Hart & Crouse, . . .	" " " "	3,000	"	
Johnson Foundry Co., . . .	Johnstown, Pa.,	5,000	"	
Grant Locomotive Works, . . .	Chicago, Ill.,	5,000	"	
Wolf Mfg. Co., . . .	" " " "	5,000	"	
Bouton Foundry Co., . . .	" " " "	5,000	"	
Vierling, McDowell Co., . . .	" " " "	5,000	"	
Hercules Iron Works, . . .	Aurora, " "	5,000	"	
J. Thompson & Son, . . .	Beloit, Wis.,	3,000	"	
Filer & Stowell Co., . . .	Milwaukee, " "	5,000	"	
Campbell & Zell Co., . . .	Baltimore, Md.,	3,000	"	
Brown & Patterson, . . .	Brooklyn, N. Y.,	2,500	"	
Hitchins & Co., . . .	New York, " "	3,000	"	
R. Hoe & Co., . . .	" " " "	5,000	"	
J. B. & J. M. Cornell, . . .	New York, " "	35,000	T. Mach.	
J. L. Mott Iron Works, . . .	" " " "	5,000	Trans. T.	
E. W. Bliss & Co., . . .	Brooklyn, " "	5,000	"	
Edison Machine Works, . . .	Schenectady, " "	5,000	"	
Samson & Sweet, . . .	Medina, " "	5,000	"	
Walter Scott & Co., . . .	Plainfield, N. J.,	5,000	"	
Steel & Condit, . . .	Jersey City, " "	4,000	"	
Fisher & Norris, . . .	Trenton, " "	5,000	"	
Wm. Sellers & Co., . . .	Philadelphia, Pa.,	5,000	"	
I. P. Morris & Co., . . .	" " " "	5,000	"	
Keeley Sove Co., . . .	Columbia, " "	5,000	"	
Robt. Wetherill & Co., . . .	Chester, " "	5,000	"	
Lewis Foundry and Mach. Co.,	Pittsburgh, " "	5,000	"	
Bailey, Farrel & Co., . . .	" " " "	20,000	T. Mach.	
Betts Machine Co., . . .	Wilmington, Del.,	4,000	Trans. T.	
Roanoke Machine Works, . . .	Roanoke, Va.,	100,000	T. Mach.	
Lane, Bodley & Co., . . .	Cincinnati, Ohio,	50,000	"	
Eberhard Mfg. Co., . . .	Cleveland, " "	5,000	Trans. T.	
Union Fdry. (Pull. Car. W. W.),	Pullman, Ill.,	5,000	Trans. T.	
Chicago Foundry, . . .	Chicago, " "	5,000	"	
Wolf Mfg. Co., . . .	" " " "	5,000	"	
F. E. Roberts, . . .	" " " "	5,000	"	
Wells & French Co., . . .	" " " "	5,000	"	
Vulcan Iron Works, . . .	" " " "	20,000	T. Mach.	
S. Chicago Foundry Co., . . .	South Chicago, " "	5,000	Trans. T.	
Emerson Talcott & Co., . . .	Rockford, " "	3,000	T. Mach.	
St. Paul Foundry Co., . . .	St. Paul, Minn.,	5,000	"	
Sultz & Vogt, . . .	Louisville, Ky.,	5,000	"	
Southwestern Iron Works, . . .	" " " "	3,000	Trans. T.	
Paxton & Vierling, . . .	Omaha, Neb.,	5,000	"	



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## PARAGRAPH 7.

### MANUFACTURERS OF COPPERS AND ALLOYS.

<i>U. S. Standard Testing Machines.</i>		<i>Capacity</i>	
		<i>Lbs.</i>	
Pennsylvania Salt Mfg. Co.,	Natrona, Pa.,	20,000	T. Mach.
Eureka Temp. Cop. Co.,	North East, "	35,000	"
E. Smeeth & Co.,	Chicago, Ill.,	20,000	"
Tamarack-Oceola C. Co.,	Dollar Bay, Mich.,	20,000	"
Buffalo Smelting Co.,	Buffalo, N. Y.,	40,000	"
Waldo & Stout,	Bridgeport, Conn.,	200,000	"

## PARAGRAPH 8.

### CAR WHEEL AND CAR MANUFACTURERS.

R. I. Loco. Works,	Providence, R. I.,	5,000	Trans. T.
Ramapo W. and Fdry. Co.,	Ramapo, N. Y.,	5,000	"
Taylor Iron Works,	High Bridge, N. J.,	40,000	T. Mach.
Harrisburg C. Mfg. Co.,	Harrisburg, Pa.,	40,000	"
McKee, Fuller & Co.,	Catasauqua, "	50,000	"
Jackson & Woodin M. Co.,	Berwick, "	60,000	"
Balto. Car. W. Co.,	Baltimore, Md.,	60,000	"
Lafayette Car Works,	Lima, Ohio,	5,000	Trans. T.
Terre Haute Car M. Co.,	Terre Haute, Ind.,	2,500	"
Indianapolis Car M. Co.,	Indianapolis, "	2,500	"
Lafayette Car Works (2),	Lafayette, "	5,000	"
U. S. Roll. Stock Co.,	Hegewich, Ill.,	5,000	"
Union Car R. R. Sup. Co.,	St. Louis, Mo.,	4,000	"
U. S. Roll. Stock Co.,	Anniston, Ala.,	5,000	"
Houston Car Wheel Co.,	Houston, Tex.,	5,000	"
Taunton Locomotive Works,	Taunton, Mass.,	5,000	"
Toronto Car W. Co.,	Toronto, Can.,	75,000	T. Mach.
Canadian Car and Loco.,	Kingston, "	50,000	Spring T.

## PARAGRAPH 9.

### CAST IRON PIPE FOUNDERS.

R. D. Wood & Co.,	Florence, N. J.,	30,000	T. Mach.
Warren Foundry,	Phillipsburg, "	30,000	"
Donaldson Iron Co.,	Emaus, Pa.,	5,000	Trans. T.
E. P. Allis Co.,	Milwaukee, Wis.,	5,000	"
Dennis Long Co.,	Louisville, Ky.,	35,000	T. Mach.
Radford P. & Fd. Co.,	Radford, Va.,	5,000	Trans. T.
Ohio Pipe Co.,	Columbus, Ohio,	20,000	T. Mach.
Howard Harrison I. Co.,	Bessemer, Ala.,	5,000	Trans. T.

## PARAGRAPH 10.

### MANUFACTURERS OF AGRICULTURAL IMPLEMENTS.

Minn. Thresher Mfg. Co.,	Stillwater, Minn.,	5,000	Trans. T.
McCormick Reap. Co.,	Chicago, Ill.,	5,000	"
Chatt. Agric. Works,	Chattanooga, Tenn.,	5,000	"
Wiard Plow Co.,	Batavia, N. Y.,	3,000	"
C. Aultman & Co.,	Canton, Ohio,	5,000	"
Hooven, Owens & Renschler Co.,	Hamilton, "	5,000	T. Mach.
Dowagiac Mfg. Co.,	Dowagiac, Mich.,	3,000	"
Port Huron Thresher Mfg. Co.,	Port Huron, "	3,000	"

## PARAGRAPH 11.

### BRIDGE BUILDERS AND SPRING MANUFACTURERS.

Cliff & Righter Co.,	Oswego, N. Y.,	30,000	Spring T.
King I. Bridge & Mfg. Co.,	Cleveland, Ohio,	100,000	T. Mach.
Atkinson Spring Works,	Chicago, Ill.,	50,000	Spring T.
Detroit Car S. Co.,	Detroit, Mich.,	75,000	"
Louisville Bridge Co.,	Louisville, Ky.,	40,000	T. Mach.
Wilkins, Post & Co.,	Atlanta, Ga.,	200,000	"
Hamilton, B. & T. Co.,	Hamilton, Ont.,	5,000	Trans. T.
Phillip S. Justice & Co. (Exp't),	London, Eng.,	10,000	Spring T.

## PARAGRAPH 12.

### BLAST FURNACES (ANTHRACITE AND CHARCOAL).

Millerton Iron Co.,	Millerton, N. Y.,	40,000	T. Mach.
Barnum, Richardson & Co.,	Lime Rock, Conn.,	40,000	"
Thomas Iron Co.,	Hokendauqua, Pa.,	100,000	"
Robesonia Iron Co.,	Robesonia, "	5,000	Trans. T.
Isabella Furnace,	Barneston, "	5,000	"
Antrim Iron Co.,	Mancelona, Mich.,	5,000	"

## U. S. Standard Testing Machines.

		<i>Capacity</i>	
		<i>Lbs.</i>	
Spring Lake Iron Co.,	Fruitport, Mich.,	5,000	Trans. T.
Woodstock Iron Co.,	Anniston, Ala.,	50,000	T. Mach.
Shelby Iron Works,	Shelby, "	50,000	"

## PARAGRAPH 13.

### MANUFACTURERS ELECTRICAL APPARATUS, WIRE MANUFACTURERS, TELEGRAPH AND TELEPHONE COMPANIES.

American Bell Telephone Co.,	Boston, Mass.,	10,000	Wire T.
Palmer Wire Co.,	Palmer, "	4,000	"
Thomson Elec. Welding Co.,	Lynn, "	100,000	T. Mach.
Thomson-Houston Elec. Co.,	"	200,000	"
"	Boston, "	10,000	Wire T.
"	Lynn, "	5,000	Tors. T.
"	"	"	Marshall Extensio.
New Haven Wire Co.,	New Haven, Conn.,	4,000	Wire T.
Benedict & Burnham Mfg. Co.,	Waterbury, "	10,000	"
Holmes, Booth & Hayden,	"	4,000	"
Bridgeport Brass Co.,	Bridgeport, "	4,000	"
Wallace & Son,	Ansonia, "	4,000	"
Scoville Mfg. Co.,	Waterbury, "	40,000	T. Mach.
Seymour Mfg. Co.,	Seymour, "	10,000	Wire T.
Carey & Moen,	New York, N. Y.,	4,000	"
N. Y. Wire & Wire Rope Co.,	"	10,000	"
Western Union Tel. Co.,	"	4,000	"
Thomas Morton,	"	4,000	"
Hammacher, Schlemmer & Co.,	"	100	"
Wolf & Co.,	"	4,000	T. Mach.
Cooper, Hewitt & Co.,	Trenton, N. J.,	10,000	Wire T.
The Trenton Iron Co.,	"	4,000	"
J. A. Roebeling & Sons Co.,	"	10,000	"
Stand. Underground Cable Co.,	Pittsburgh, Pa.,	50,000	"
Cin. Sub. Telephone Asso.,	Cincinnati, Ohio,	4,000	"
J. L. Ellegood & Co.,	De Kalb, Ill.,	2,000	"
W. H. Banks & Co.,	Chicago, "	4,000	"
Western Electric Co.,	"	4,000	"
Western Union Tel. Co.,	"	5,000	"
Freeman W. & I. Co.,	E. St. Louis, "	2,000	"
Electrical Supply Co.,	Chicago, "	20,000	T. Mach.
Broderick & Bascom,	St. Louis, Mo.,	4,000	Wire T.
A. Leschen & Co.,	"	10,000	"
Harrison Wire Co.,	"	10,000	"
J. B. Speed & Co.,	Louisville, Ky.,	2,000	"
A. H. Hallidie,	San Francisco, Cal.,	2,000	Wire T.
Cooper, Fairman & Co.,	Montreal, Can.,	2,000	"

## PARAGRAPH 14.

### PIANO MANUFACTURERS AND PIANO SUPPLIES.

A. Dolge,	Dolgeville, N. Y.,	100	Wire T.
Blasius & Son,	Philadelphia, Pa.,	100	"
Wm. Knabe & Co.,	Baltimore, Md.,	800	Trans. T.
"	"	50,000	T. Mach.

## PARAGRAPH 15.

### HEMP AND MANILLA ROPE AND TWINE MANUFACTURERS.

John Good,	New York,	50,000	Rope T.
John T. Bailey & Co.,	Philadelphia, Pa.,	500	Twine T.
Schlichter Mfg. Co.,	"	1,000	"
Wilmington Mills M. Co.,	Wilmington, Del.,	1,000	"
G. B. Carpenter Co.,	Chicago, Ill.,	1,000	"

## PARAGRAPH 16.

### CLOTH MANUFACTURERS AND MERCHANTS.

Everett Mills,	Lawrence, Mass.,	500	Cloth T.
Assabet Mfg. Co.,	Maynard, "	100	"
S. Pomeroy & Sons,	Pittsfield, "	500	"
Nashua Mfg. Co.,	Nashua, N. H.,	3-100	"
Union Mfg. Co.,	Torrington, Conn.,	100	"
Wm. Simpson,	Philadelphia, Pa.,	500	"
Wm. Ayers & Co.,	"	2-500	"
Hood, Foulkrod & Co.,	"	500	"
Pitkin & Thomas,	"	100	"
Estate of J. B. Kent,	Clifton, "	100	"
Hawthorne Mills,	Astoria, L. I.,	500	"



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## U. S. Standard Testing Machines.

		Capacity Lbs.	
Strong & Co., . . . . .	New York, N. Y.,	500	Cloth T.
Sullivan, Vail & Co., . . . . .	"	500	"
B. Y. Pippey & Co., . . . . .	"	500	"
Brinckerhoff, Turner & Co., . . . . .	"	500	"
Waterloo Wool Mfg. Co., . . . . .	Waterloo, "	500	"
Thomas Oakes & Co., . . . . .	Bloomfield, N. J.,	500	"
East Lake Woolen Co., . . . . .	Bridgeton, "	500	"
Dean Woolen Co., . . . . .	Newark, Del.,	100	"
Social Mfg. Co., . . . . .	Woonsocket, R. I.,	500	"

## PARAGRAPH 17.

### MISCELLANEOUS.

American Screw Co., . . . . .	Providence, R. I.,	10,000	T. Mach.
Standard Oil Co. (for Export), New York, N. Y.,	"	20,000	"
Runkel, Smith & Co. (for Ex.),	"	1,000	Cement T.
Acme Oil Co., . . . . .	Olean, "	20,000	T. Mach.
Atlantic Refining Co., . . . . .	Philadelphia, Pa.,	60,000	"
Imperial Refining Co., . . . . .	Oil City, "	20,000	"
Cleveland Ref. Co., . . . . .	Cleveland, Ohio,	20,000	"
Standard Oil Co., . . . . .	Bayonne, N. J.,	20,000	"
Chicago Skein and Axle, . . . . .	Chicago, Ill.,	5,000	Trans. T.
R. W. Hunt & Co., . . . . .	"	200,000	T. Mach.
Paige, Carey & Co., . . . . .	Wheeling, W. Va.,	1,000	Cement T.
" " " " " " " "	"	50,000	T. Mach.
Hartford Rubber Works, . . . . .	Hartford, Conn.,	500	Cloth T.

## PARAGRAPH 17<sup>2</sup>.

### STEAMSHIP AND ENGINE BUILDERS.

Herreshoff Mfg. Co., . . . . .	Bristol, R. I.,	30,000	T. Mach.
The Harlan & Hollingsworth Co., . . . . .	Wilmington, Del.,	100,000	"
Union Iron Works, . . . . .	San Francisco, Cal.,	100,000	"
The Risdon Iron Works, . . . . .	"	60,000	"
S. L. Moore, Sons & Co., . . . . .	Elizabethport, N. J.,	3,000	"

## PARAGRAPH 18.

### PUBLIC WORKS.

Boston Water Works, . . . . .	Boston, Mass.,	1,000	Cement T.
Metropolitan Sewage Co., . . . . .	"	2,000	"
Dept. Public Works, . . . . .	"	1,000	"
City Engineer, . . . . .	West Newton, "	2,000	"
Dept. of Public Works, . . . . .	Providence, R. I.,	1,000	"
City Engineer, . . . . .	New Haven, Conn.,	1,000	Cement T.
Arrowhead Reservoir Co., . . . . .	San Bernard, Cal.,	2,000	"
H. Thompson, C. E., . . . . .	Seattle, Wash.,	1,000	"
St. Louis Street Dept., . . . . .	St. Louis, Mo.,	1,000	"
Dept. of Public Parks, . . . . .	New York, N. Y.,	1,000	"
Buffalo City Water Works, . . . . .	Buffalo, N. Y.,	1,000	T. Mach.

## NEW YORK.

Chief Engr. (Dept. of Docks), New York,	1,000	Cement T.
Dept. of Public Works, . . . . .	2—800	"
Com. of New Aqueduct, . . . . .	1,000	"
Chief Engr. (Aqueduct Com.), " . . . . .	500	"
Bureau of Sewers, . . . . .	1,000	"
Dept. of City Works, . . . . . Brooklyn,	2—1,000	"
Croton Aqueduct Department, Yonkers,	1,000	"
" " " " " " " "	15,000	"
" " " " " " " "	1,000	"
" " " " " " " "	1,000	"
Department of Docks, . . . . . New York City,	150,000	T. Mach.

### NEW AQUEDUCT (BU. ADD. WATER SUPPLY).

Tarrytown, . . . . .	1,000	Cement T.
Div. 1 Sing Sing, . . . . .	500	"
Div. 2, " . . . . .	500	"
Div. 3, Tarrytown, . . . . .	500	"
Div. 4, Dobb's Ferry, . . . . .	500	"
Div. 5, Yonkers N., . . . . .	500	"
Div. 6, Morris Dock, . . . . .	500	"
Div. 7, 125th St., . . . . .	500	"
South Yonkers, . . . . .	500	"
N. Y. Harbor, Statue of Liberty, . . . . .	1,000	"

Chief Engr. (Survey Dept.),	Philadelphia, Pa.,	1,000	Cement T.
“ “ “ “ “ “ “ “	“ “	100	“
Scranton Gas and Water Co.,	Scranton, “	1,000	“
Com. of Highways, . . . . .	Pittsburgh, “	1,000	“

## U. S. Standard Testing Machines.

		Capacity Lbs.	
City Engr. (Md. Con. Co.), . . . . .	Baltimore, Md.,	1,000	Cement T.
Paterson Water Dept., . . . . .	Paterson, N. J.,	1,000	"
Dept. of Public Works, . . . . .	"	1,000	"
Ch. Engr. (Board of Pub. Wks.), Cincinnati, Ohio,	"	300	"
City Engineer, . . . . .	Cleveland, "	2,000	"
" . . . . .	Columbus, "	1,000	"
" . . . . .	Sandusky, "	1,000	"
City Engineer (Water Dept.), St. Louis, Mo.,	"	1,000	"
Louisville Water Co., . . . . .	Louisville, Ky.,	30,000	T. Mach.
City Engineer, . . . . .	Anniston, Ala.,	1,000	Cement T.
City Engineer, . . . . .	Los Angeles, Cal.,	2,000	"
City Engineer, . . . . .	Austin, Tex.,	4,000	"
City Engineer, . . . . .	Toronto, Can.,	1,000	"
West Indies Improvement Co., Kingston, Jamaica,	"	1,000	"

## PARAGRAPH 19.

### ENGINEERS, ARCHITECTS, AND INDIVIDUALS.

D. H. & H. P. Tower, . . . . .	Holyoke, Mass.,	300	Cement T.
Howard Fleming, . . . . .	New York, N. Y.,	1,000	"
R. M. Hunt, . . . . .	"	1,000	"
Hugh N. Camp, . . . . .	"	1,000	"
Geo. B. Post, . . . . .	"	1,000	"
W. R. Taylor, Civ. E., . . . . .	East View, "	1,000	"
Chas. B. Brush, . . . . .	Hoboken, N. J.,	800	"
Carrol Phillips Basset, . . . . .	Newark, "	1,000	"
Claus Spreckels, . . . . .	Philadelphia, Pa.,	2,000	"
James H. McGill, . . . . .	Washington, D. C.,	1,000	"
Thompson, Francis & Cheno-	"	"	"
with, . . . . .	Birmingham, Ala.,	1,000	"
Gus. Wilke, Engineer, . . . . .	Austin, Tex.,	4,000	"
Walter Tips, Engineer, . . . . .	"	1,000	"

## PARAGRAPH 20.

### CEMENT COMPANIES AND DEALERS.

Lawrence Cem. Co., . . . . .	New York, N. Y.,	1,000	Cement T.
Standard Cem. Co., . . . . .	"	1,000	"
Hudson River Cem. Co., . . . . .	"	1,000	"
Lawrenceville Cem. Co., . . . . .	"	800	"
N. Y. & Rosendale Cem. Co., . . . . .	"	1,000	"
N. Y. Cement Co., . . . . .	"	800	"
The Delafield & Baxter Cement Co., . . . . .	"	1,000	"
J. B. White Bros., . . . . .	"	2,000	"
J. R. Keator, . . . . .	"	800	"
F. O. Norton, . . . . .	"	800	"
Newark & Rosendale Cem. Co., Whiteport,	"	800	"
Union Portland Cem. Co., . . . . .	Rondout, "	2,000	"
Howe's Cave Association, . . . . .	Albany, "	1,000	"
Buffalo Cement Co., . . . . .	Buffalo, "	1,000	"
E. Magee & Co., . . . . .	Allegheny, Pa.,	1,000	"
Coplay Cement Co., . . . . .	Allentown, "	2,000	"
Lehigh Valley Portland Cement Co., . . . . .	Coplay, "	1,000	"
Hoopes Art. Stone Co., . . . . .	Baltimore, Md.,	4,000	"
Portland Cement Co., . . . . .	Columbus, Ohio,	1,000	"
Utica Mfg. Co., . . . . .	La Salle, Ill.,	1,000	"
Dickinson Bros. & K., . . . . .	Chicago, "	1,000	"
Fort Dodge Gypsum Stucco Co., Fort Dodge,	Ia.,	1,000	"
Denver Cement Co., . . . . .	Denver, Col.,	1,000	"
West Portland Cem. Co., . . . . .	Yankton, Dak.,	2,000	"
Stoney Landing Co., . . . . .	Charleston, S. C.,	2,000	"
Birmingham Cem. Co., . . . . .	Birmingham, Ala.,	1,000	"
F. Kalteyer & Son, . . . . .	San Antonio, Tex.,	4,000	"
Salt Lake City Corp., . . . . .	Salt Lake City, Utah,	1,000	"
Wheeling Lime & Cement Co., Wheeling, W. Va.,	"	600	"
Drummond, McCall Co., . . . . .	Montreal, Can.,	1,000	"

## PARAGRAPH 21.

### BICYCLE MANUFACTURERS.

Pope Mfg. Co., . . . . .	Hartford, Conn.,	2,000	Wire T.
" " " " " " " "	"	40,000	T. Mach.
Overman Wheel Co., . . . . .	Chicopee Falls, Mass.,	Riehle-Yale Ex.	"
" " " " " " " "	"	2,000	Wire T.
" " " " " " " "	"	40,000	T. Mach.
Pratt & Cady Co., . . . . .	Hartford, Conn.,	40,000	"
Comstock and Wing, . . . . .	Chicago, Ill.,	4,000	Wire T.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Additional List of Names and Addresses of Parties Using the Riehlé Testing Machines.

(The most important features of these machines are covered by U. S. Letters Patent, controlled and made only by Riehlé Bros. Testing Machine Co.)

### PARAGRAPH 1. UNITED STATES GOVERNMENT.

<i>U. S. Standard Testing Machines.</i>	<i>Capacity Lbs.</i>
U. S. Engineers Office, Lieut. Col. Peter C. Hains, Portland, Me., . . .	1,000 Cement T. with Worm Gear, Rubber Grips, Sieves, and extra Molds.
U. S. Naval Academy, . . . . . Annapolis, Md.,	Deviation Model.
" " " " " " " " " " " "	" Riehlé-Boston Ex.
Inspector of Asphalt & Cements, District of Columbia, Clifford Richardson, Insp. Washington, D. C.,	2 Cement Molds 6 in. x 1 in. x 1 in., 1 in. Cube Mold.

### FOREIGN GOVERNMENTS.

Canadian Government, Dept. of Canals, . . . . . Ottawa, Can.,	5 2,000 Cement T. with complete outfit of appliances.
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### PARAGRAPH 2. IRON AND STEEL WORKS.

Johnson Co., . . . . . Johnstown, Pa.,	Riehlé-Yale Exten. Riehlé-Vernier.
Cambria Iron Co., . . . . . " "	" Riehlé-Yale Exten.
Pullman I. & S. Co., . . . . . Pullman, Ill.,	100,000 T. Mach. with Vernier Poise.

### PARAGRAPH 3. CHAIN MANUFACTURERS AND BOILER-MAKERS.

Ewart Mfg. Co., . . . . . Indianapolis, Ind.,	2 20,000 T. Mach.
Logan Iron & Steel Co., . . . . . Burnham, Pa.,	300,000 Chain T. with Certificate of Lloyd's Register. (also arranged for Car Links and Pins.)
Bridgeport Chain Co., . . . . . Bridgeport, Conn.,	4,000 Wire T.

### PARAGRAPH 4. RAILROAD COMPANIES.

Metropolitan West Side Elevated Ry. Co., . . . . . Chicago, Ill.,	1,000 Cement T. with Worm Gear, Rubber Grips, Cement Test Wires, Sieves, and full outfit.
Chicago, St. P., Minn. & Omaha R. R. Co., . . . . . St. Paul, Minn.,	150,000 T. Mach. with Vernier Beam, Riehlé-Yale Exten.
Penna. R. R. Co., . . . . . Altoona, Pa.,	Vernier Poise Beam for their Riehlé 100,000 T. Mach. Riehlé Double-pointed Centre Punch.

### PARAGRAPH 5. LIST OF COLLEGES AND UNIVERSITIES.

State College of Kentucky, . . Lexington, Ky.,	100,000 T. Mach. with Riehlé-Buzby Automatic Electric Beam. Prof. F. Paul Anderson.
Maine State College, . . . . . Orono, Me.,	60,000 T. Mach. with Vernier Beam.
Maine State College, . . . . . Orono, Me.,	2,000 Cement T. with Worm Gear, Rubber Grips, Crushing Tools, Cement Test Wires, Sieves, etc. Prof. George H. Hamlin.
Leland Stanford, Jr., University, Mayfield, Cal.,	20,000 T. Mach. with Vernier Beam and Elastic Limit Indicator. Prof. L. M. Hoskins, M. E.
Univ. of California, . . . . . Berkley, Cal.,	5,000 Trans. T. with Indicator. Prof. H. J. Randall.
Ohio State University, . . . . . Columbus, O.	Set Rubber Grips, 20 extra Molds, Cement Test Wires, Cement Sieves. Prof. S. W. Robinson.
Baltimore Man. Train. School, . Baltimore, Md.,	50,000 T. Mach. with Vernier Beam. Prof. J. H. Saville.
Rose Poly. Inst. Tech., . . . . . Terre Haute, Ind.,	Riehlé-Gray Au- tomatic Weighing and Recording Attachment.
Johns Hopkins University, . . . Baltimore, Md.,	2,000 Dynamometer.
Case School Applied Mechanics, Cleveland, O.,	Riehlé-Benjamin Exten.

### PARAGRAPH 6. IRON FOUNDRIES AND MACHINISTS.

<i>U. S. Standard Testing Machines.</i>	<i>Capacity Lbs.</i>
Standard Tool Co., . . . . . Cleveland, O.,	5,000 Tors. T.
Gould Mfg. Co., . . . . . Seneca Falls, N. Y.,	5,000 Trans. T. with Indicator.
Otis Bros. & Co., . . . . . Yonkers, N. Y.,	3,000 Trans. T. with Indicator.
Scranton Stove Works, . . . . . Scranton, Pa.,	3,000 Trans. T. with Indicator.
O. T. Faxon & Co., . . . . . Boston, Mass.,	30,000 T. Mach. with Indicator.
E. Rumley Mfg. Co., . . . . . La Porte, Ind.,	3,000 Trans. T. with Indicator.
Lane Mfg. Co., . . . . . Montpelier, Vt.,	3,000 Trans. T. with Indicator.
Falls River Machine Co., . . . Cuyahoga Falls, N. Y.,	3,000 Trans. T. with Indicator.
Snead & Bibb Iron Works . . Louisville, Ky.,	3,000 Trans. T. with Indicator.
Pettee Machine Works, . . . Newton Upper Falls, Mass.,	5,000 Trans. T. for 48-in. specimens, with Indicator.

### PARAGRAPH 7. MANUFACTURERS OF COPPERS AND ALLOYS.

Anaconda Mining Co., . . . . . Anaconda, Mont.,	4,000 Wire T.
" " " " " " " "	" Tors. T. Machine.
Baltimore Elec. Refining Co., . Baltimore, Md.,	4,000 Wire T.

### PARAGRAPH 8. CAR WHEEL AND CAR MANUFACTURERS.

Madison Car Co., . . . . . Madison, Ill.,	5 000 Trans. T. with Indicator.
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### PARAGRAPH 10. MANUFACTURERS OF AGRICULTURAL IMPLEMENTS.

A. Plamondon Mfg. Co., . . . . . Chicago, Ill.,	3,000 Trans. T. with Indicator.
Gillette-Herzog Co., . . . . . Minneapolis, Minn.,	5,000 Trans. T.
B. F. Avery & Sons, . . . . . Louisville, Ky.,	3,000 Trans. T. with Indicator.
Jas. B. Clow & Sons, . . . . . New Philadelph'a, O.,	5,000 Trans. T. with Indicator.
Hoosier Drill Co., . . . . . Richmond, Ind.,	3,000 Trans. T.
toddart Mfg. Co., . . . . . Dayton, Ohio,	3,000 Trans. T.
Warder, Bushnell & Glessner Co., . . . . . Springfield, Ohio,	50,000 T. Mach.
Jas. Leffel & Co., . . . . . " "	3,000 Trans. T. with Indicator.
Ohio Rake Co., . . . . . Dayton, O.,	5,000 Dynamometer.

### PARAGRAPH 13. MANUFACTURERS ELECTRICAL APPARATUS, WIRE MANUFACTURERS, TELEGRAPH AND TELEPHONE COMPANIES.

Amer. Tel. & Telephone Co., . New York, N. Y.,	30,000 T. Mach. with Vernier Beam.
Mogul Mfg. Co., . . . . . New York, N. Y.,	2,000 Wire T.
Chas. Reinworth, . . . . . " "	4,000 " "
R. H. Wolf Co., Ltd., . . . . . " "	10,000 " "

### PARAGRAPH 14. PIANO MANUFACTURERS AND PIANO SUPPLIES.

Robt. M. Webb, . . . . . New York, N. Y.,	Piano Key T. M.
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## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

### PARAGRAPH 15.

#### HEMP AND MANILLA ROPE AND TWINE MANUFACTURERS.

Overman & Schraeder, . . . . Covington, Ky., . . 1,000 Twine T.

### PARAGRAPH 16.

#### CLOTH MANUFACTURERS AND MERCHANTS.

Baldwin, the Clothier, . . . . Brooklyn, N. Y., . . 500 Cloth T.  
Buena Vista Cassimere Mills, . Buena Vista, Va., . . 200 "  
Dundee Woolen Co., . . . . Passaic, N. Y., . . . 500 "

### PARAGRAPH 17.

#### MISCELLANEOUS.

Page Belting Co., . . . . . Concord, N. H., . . 4,000 T. Mach.  
Boston Belting Co., . . . . Boston Mass., . . . 5,000 Com. T. M.  
Booth, Garrett & Blair, . . . Philadelphia, Pa., 100,000 T. Mach.  
with Riehlé-Buzby Automatic Electric Beam.  
Studebaker Bros. Mfg. Co., . . South Bend, Ind., . 5,000 Trans. T.  
with Indicator.  
Rosendale Belting Co., . . . . Newark, N. J., 2,000 Dynamometer.  
Syracuse Tube Co., . . . . . Syracuse, N. Y.,  
2,000 Dynamometer.

### PARAGRAPH 17 1-2.

#### STEAMSHIP AND ENGINE BUILDERS.

Atlas Engine Works, . . . . Indianapolis, Ind., . 50,000 T. Mach.

### PARAGRAPH 18.

#### PUBLIC WORKS.

Syracuse Water Board, . . . . Syracuse, N. Y., . . 1,000 Cement T.  
with extra Molds, Mixing Table, Sieves, and Sundries.  
W. C. Parmley, C. E., . . . . Ogden, Utah, . . . 1,000 Cement T.  
with appliances.

### PARAGRAPH 19.

#### ENGINEERS, ARCHITECTS, AND INDIVIDUALS.

Sponeberg & Waddington, . . Watertown, N. Y., . 1,000 Cement T.  
with appliances.  
Geo. M. Newhall Engine Co., . Philadelphia, . 2,000 Dynamometer.  
Dr. R. S. Huidekoper, . . . . Philadelphia, . 2,000 Dynamometer.

### PARAGRAPH 20.

#### CEMENT COMPANIES AND DEALERS.

Quaker City Mortar Co., . . . Philadelphia, Pa., . 2 4-Gang Cement  
Molds.  
Diamond Portland Cement Co., Middle Branch, O., 2,000 Cement T.  
with Worm Gear and appliances for testing.

### PARAGRAPH 22.

#### CAR COUPLER, CAR LINKS AND PINS AND BRAKE BEAM MANUFACTURERS.

The Sargeant Co., . . . . . Chicago, Ill., . . . 300,000 T. Mach.  
(Vertical) for Car Couplers, Brake, Beams, etc.  
Chicago Tire & Spring Co., . . . " " . . . 200,000 T. Mach.  
(Horizontal) for Car Couplers, Links, etc.

### PARAGRAPH 23.

#### MANUFACTURERS OF STEEL AND MALLEABLE IRON CASTINGS.

Taylor Iron & S. Co., . . . . High Bridge, N. J., 200,000 T. Mach.  
with Riehlé-Buzby Automatic Electric Beam.  
Penn Steel Casting Co., . . . . Chester, Pa., . . 100,000 "  
with Vernier Beam.  
Stanley G. Flagg & Co., . . . Philadelphia, Pa., . 5,000 Trans. T.  
with Indicator.



## TESTIMONIALS.

### Extracts from Letters—Originals on File for Examination.

**NORRISTOWN STEEL CO.**, Norristown, Pa.: "We believe it to be the best TESTING MACHINE made and can most favorably recommend it." Plate 34, 100,000 lbs. Testing Machine. **GEO. J. HUMBERT**, Vice-President and General Manager.

**THOMAS IRON CO.**, Hokendauqua, Pa.: "The Machine is giving good satisfaction." Plate 34, 100,000 lbs. Testing Machine. **D. H. THOMAS**, Superintendent.

**WALDO & STOUT**, Bridgeport, Conn. "Extremely satisfactory, and accurate in every way. It is away ahead of any other Machine we have seen." Plate 154, 200,000 lbs. Testing Machine. **WALDO & STOUT**.

**EUREKA CAST STEEL CO.**, Chester, Pa.: "Giving us entire satisfaction." Plate 34, 100,000 lbs. Testing Machine. **AMOS GARTSIDE**, President.

**OVERMAN & SCHRADER**, Covington, Ky.: "We use Machine daily, and it shows no wear." Twine Tester, Plate 33.

**HOWE, BROWN & CO.**, Pittsburgh, Pa.: "Your Machine has been doing very well." Plate 176, 50,000 lbs. Testing Machine.

**INDIANA STEEL CO.**, Indianapolis, Ind.: "Your TESTING MACHINE has been giving us every satisfaction." Plate 34, 100,000 lbs. Testing Machine. **W. H. COEN**, Secretary and General Manager.

**BURDEN IRON CO.**, Troy, N. Y.: "The TESTING MACHINE (200,000 lbs. Testing Machine 'Schley') and EXTENSOMETER (Riehle, Plate 172) are entirely satisfactory, and you may take the liberty of referring to us." **DANL. W. TALCOTT, Jr.**

**THE DETROIT STEEL AND SPRING CO.**, Detroit, Mich.: "The Machine is perfectly satisfactory, and we would be glad to tell any one so." Plate 192, 80,000 lbs. Spring Tester. **M. D. W. LOOMIS**, Manager.

**CHICAGO TIRE & SPRING CO.**, Chicago, Ill.: "The Machine is in active service, to our entire satisfaction; rapidly adjusted and as quick in operation as we could ask." Plate 22, 200,000 lbs. Car Coupler Machine. **C. H. FERRY**, President.

**CLIFF, RIGHTER & CO., Ltd.**, Oswego, N. Y.: "Gives excellent satisfaction." Plate 8, 25,000 lbs. Spring Testing Machine.

**POTTSVILLE IRON AND STEEL CO.**, Pottsville, Pa. "Gives us satisfaction." Plate 34, 100,000 lbs. Testing Machine. **WILLIAM ATKINS**, President.

**MARE ISLAND NAVY YARD**, Mare Island, Cal.: "Efficient and in every way satisfactory." Plate 37, 60,000 lbs. Testing Machine. **GEO. F. KUTZ**, Chief Engineer, U. S. N.

**LANDORE STEEL WORKS**: "A very desirable instrument. Carefully finished and compact in form." Plate 10, 20,000 lbs. Testing Machine. **WILLIAM SIEMENS**.

**WASHINGTON UNIVERSITY**, St. Louis, Mo.: "Doing its work satisfactorily. Thousands of tests made with it." Plate 34, 100,000 lbs. Testing Machine. **J. B. JOHNSON**, Prof. M. E.

**ANDREWS BROS. CO.**, Youngstown, Ohio: "Working satisfactorily." Plate 34, 100,000 lbs. Testing Machine. **JAS. NEILSON**, Vice-President.

EXTRACT FROM REPORT OF JUDGES OF AWARDS AT THE CENTENNIAL EXHIBITION, 1876: "Commended for the manufacture of TESTING MACHINES for ascertaining the strength of materials, of superior design and construction, combining true mechanical principles, with great judgment and ingenuity in the disposition of parts."

EXTRACT OF REPORT OF BOARD OF UNITED STATES ENGINEERS, APPOINTED BY G. W. MELVILLE, U. S. N., CHIEF OF BUREAU OF STEAM ENGINEERING, WASHINGTON, D. C.: "The many features in the wearing parts of the Machine to insure firmness and durability receive the highest commendation of the Board." Plate 154, 200,000 lbs. Testing Machine. This Machine was built for and is now in use at the Midvale Steel Works, Philadelphia.

EXTRACT OF REPORT OF BOARD APPOINTED BY SECRETARY OF WAR, ACTING FOR ORDNANCE DEPARTMENT: "The Board is of the opinion that the RIEHLÉ PATENT WEDGE GRIP, if properly used and suitably adjusted when unfinished specimens are to be tested, is the best device for general use in ordinary Testing Machines known to the Board." "The RIEHLÉ PATENTED VERNIER WEIGHING BEAM is considered by the Board an excellent arrangement, combining ease of manipulation, convenience, and rapidity." "The number of changes of speed, being eight testing speeds and four reverse speeds, is considered a specially meritorious feature of the Machine." Plate 34, 100,000 lbs. Testing Machine.

**U. S. NAVY YARD**, Boston, Mass., Bureau of Equipment and Record: "Entirely satisfactory for the purpose to which it is adapted." Plate 154, 200,000 lbs. Testing Machine. **GEO. DEWEY**, Chief of Bureau.

**UNION SWITCH AND SIGNAL CO.**, Swissvale, Pa.: "Giving us entire satisfaction." Plate 34, 100,000 lbs. Testing Machine. **E. H. GOODMAN**, General Manager.

**EDISON MACHINE WORKS**, Schenectady, N. Y.: "Very satisfactory indeed" Plate 17, 4,000 lbs. Testing Machine. **SAML. INSUL**, General Manager.

**UNION IRON WORKS**, San Francisco, Cal.: "Gives perfect satisfaction, and we are very proud of it." Plate 34, 100,000 lbs. Testing Machine. **IRVING M. SCOTT**, General Manager.

**UNIVERSITY OF ILLINOIS**, Champaign, Ill.: "The Machine gives satisfactory work." Plate 34, 100,000 lbs. Testing Machine. **S. H. PEABODY**, C. E.

**CARBON IRON CO.**, Pittsburgh, Pa.: "Gives satisfaction." Plate 34, 100,000 lbs. Testing Machine. **H. W. LASH**, General Superintendent.

**WM. SELLERS & CO.**, Philadelphia, Pa.: "The Foundry Testing Machine purchased of you satisfactorily answers the purpose for which it was procured." Plate 13, 5,000 lbs. Transverse Testing Machine.

**AMERICAN SCREW CO.**, Providence, R. I.: "Perfect satisfaction." Plate 11, 10,000 lbs. Testing Machine.

**ATLANTIC REFINING CO.**, Philadelphia, Pa.: "Entire satisfaction." "Do not object to your referring to us" Plate 37, 60,000 lbs. Testing Machine. **C. E. BUSHNELL**, Secretary.

**COLLEGE OF NEW JERSEY**, Princeton: "Very satisfactory. You can refer to me." Plate 14, 1,000 lbs. Cement Tester. **PROF. CHARLES McMILLAN**.

**JOHN T. BAILEY & CO.**, Philadelphia: "The best we have seen." Plate 33, Binder Twine Tester.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

- DEPARTMENT OF PUBLIC WORKS**, New York: "Cheerfully recommended for accuracy and durability." Plate 14, Cement Tester. **JOS. O. B. WEBSTER**, Assistant Engineer.
- STATUE OF LIBERTY**, New York: "Most satisfactory." "Has tested all of the cement for foundation of Statue of Liberty." Plate 17, Cement Tester. **CHAS. P. STONE**, Engineer-in-Chief.
- PENNSYLVANIA SALT MANUFACTURING CO.**, Natrona, Pa.: "Gives perfect satisfaction; you may refer to us." Plate 153, 20,000 lbs. Testing Machine. **R. G. EWER**, Superintendent.
- GUTTA PERCHA AND RUBBER MANUFACTURING CO.**, New York: "Well pleased; ready to testify to its excellence." Plate 25, Cloth Tester. **A. SPADONE**, President.
- T. B. & J. M. CORNELL**, New York: "Entirely satisfactory." Plate 153, 20,000 lbs. Testing Machine.
- WEST VIRGINIA UNIVERSITY**, Morgantown, W. Va.: "Has proven very satisfactory." Plate 164, 40,000 lbs. Testing Machine. **PROF. T. M. JACKSON**.
- E. P. ALLIS & CO.**, Milwaukee, Wis.: "Very satisfactory, and we cheerfully recommend it." Plate 13, 5,000 lbs. Transverse Testing Machine.
- UNIVERSITY OF WISCONSIN**, Madison, Wis.: "Excellent Machine—especially adapted for use in Engineering Schools." Plate 14, Cement Tester. **PROF. ALLAN G. CONOVER**.
- THOMSON ELECTRIC WELDING CO.**, Lynn, Mass.: "Perfect satisfaction, and we are using it constantly." Plate 34, 100,000 lbs. Testing Machine. **O. C. HALL**, Superintendent.
- I. L. ELWOOD & CO.**, De Kalb, Ill.: "So satisfactory we could not get along without it." Plate 17, 4,000 lbs. Testing Machine.
- KING IRON BRIDGE AND MANUFACTURING CO.**, Cleveland, Ohio.: "Perfect satisfaction." Plate 34, 100,000 lbs. Testing Machine. **JAMES A. KING**, President.
- SIBLEY COLLEGE, CORNELL UNIVERSITY**, Ithaca, N. Y.: "It is a beauty." Plate 34, 100,000 lbs. Testing Machine. **R. H. THURSTON**, Director.
- SIBLEY COLLEGE, CORNELL UNIVERSITY**, Ithaca, N. Y.: "This Machine is as handsome and neatly made as it is accurate." Plate 34, 100,000 lbs. Testing Machine. (See *The Crank*, May, 1891.)
- STATE AGRICULTURAL AND MECHANICAL COLLEGE**, College Station, Texas: "I am especially pleased with this Machine." Plate 153, 20,000 lbs. Testing Machine. **PROF. J. C. NAGLE**.
- P. HAYDEN SADDLERY HARDWARE CO.**, Columbus, Ohio: "Continues to give satisfaction. Can refer to us." Plate 22, 200,000 lbs. Chain Tester.
- BALTIMORE & OHIO RAILROAD**, Baltimore, Md.: "A very fine instrument and gives every satisfaction." Plate 34, 100,000 lbs. Testing Machine. **G. B. HAZLEHURST**, G. S. M. P.
- HERESHOFF MANUFACTURING CO**, Bristol, L. I.: "Satisfaction in every respect." Plate 164, 40,000 lbs. Testing Machine.
- CAMBRIA IRON CO.**, Johnstown, Pa.: "A very fine instrument." Plate 179, Riehle-Yale Extensometer. **J. E. KRESS**, Engineer of Tests.
- MASSACHUSETTS INSTITUTE OF TECHNOLOGY**, Boston, Mass.: "The Machine has given entire satisfaction." Plate 14, 1,000 lbs. Cement Tester. **GEO. F. SWAIN**, Professor.
- CITY OF PITTSBURGH**, Pittsburgh, Pa.: "Very satisfactory." Plate 14, 1,000 lbs. Cement Tester. **E. M. BIGELOW**, C. E.
- AQUEDUCT COMMISSION**, New York: "Working satisfactorily. (Thirteen in use)" Plate 14, Cement Tester. **B. S. CHURCH**, Chief Engineer.
- CROTON AQUEDUCT**, New York: "Good satisfaction." Plate 14, 1,000 lbs. Cement Tester. **G. W. BIRDSALL**, Chief Engineer.
- CITY OF TORONTO**, Canada: "Entire satisfaction." Plate 14, 1,000 lbs. Cement Tester. **C. SPROATT**, Chief Engineer.
- ARCHITECT**, New York: "Has proved itself satisfactory." Plate 14, 1,000 lbs. Cement Tester. **G. B. POST**, Architect.
- WASHINGTON AQUEDUCT**, Washington, D. C.: "Gives the highest satisfaction." Plate 14, 1,000 lbs. Cement Tester. **THOS. W. SYMONS**, Captain of Engineers.
- GOULD COUPLER CO.**: "Our 200,000 lbs. capacity TESTING MACHINE furnished us by you is doing its work very satisfactorily. We have had no breaks or repairs to make on it." Plate 22, 200,000 lbs. Testing Machine. **J. O. GOULD**, Superintendent.
- U. S. ENGINEER'S OFFICE**, Washington, D. C.: "I find your CEMENT TESTING MACHINE very satisfactory." Plate 14, 1000 lbs. Cement Testing Machine. **PETER C. HAINS**, U. S. A., Lieutenant Colonel of Engineers.
- DISTRICT OF COLUMBIA**, Washington, D. C.: "Your CEMENT TESTING MACHINE is employed in testing all the cements in use in public work under the District Government." Plate 14, 1000 lbs. Testing Machine. **CLIFFORD RICHARDSON**, Inspector.
- U. S. LOCAL INSPECTOR OF STEAM VESSELS**, Wheeling, W. Va.: "Your TESTING MACHINE gives perfect satisfaction." Plate 6, 50,000 lbs. **BENJ. F. GOODWIN AND REUBEN M. THOMAS**, Local Inspectors.
- LEBANON CHAIN WORKS**, Lebanon, Pa.: "The CHAIN TESTING MACHINE of your make is giving entire satisfaction, and we will be pleased to recommend it." Plate 22, 300,000 lbs. Chain Tester.
- U. S. NAVY YARD**, New York (Inspection Provision and Clothing): "Your CLOTH TESTING MACHINE has been pronounced by experts who have used it in this department to be the best machine in the market." Plate 189, 200 lbs. **W. W. WOODHALL**, Paymaster, U. S.
- W. S. CLARK'S SONS & CO.**, Pittsburgh, Pa.: "The HOOP IRON TESTING MACHINE made for us by you has given satisfaction."
- PHOENIX IRON WORKS**, Phoenixville, Pa.: "Our TESTING MACHINE of your make is working quite satisfactorily." 150,000 lbs. Testing Machine. **AMORY COFFIN**, Chief Engineer.
- STATE UNIVERSITY OF IOWA**, Iowa City, Ia.: "The TESTING MACHINES purchased a few years ago have been in constant use, and have given the most perfect satisfaction." 1000 lbs. Cement Testing Machine, and Plate 34, 100,000 lbs. Testing Machine. **PROF. CHAS. D. JAMIESON**.
- CASE SCHOOL OF APPLIED SCIENCE**, Cleveland, O.: "Your TESTING MACHINE is giving us good satisfaction." Plate 37, 60,000 Testing Machine. **PROF. C. H. BENJAMIN**.
- PENNSYLVANIA STATE COLLEGE**, State College, Pa.: "Can cordially recommend the TESTING MACHINES purchased from you." Plate 34, 100,000 lbs.; Plate 159, Torsional Testing Machine; 2000 lbs. Cement Testing Machine. **PROF. LOUIS H. BARNARD**.

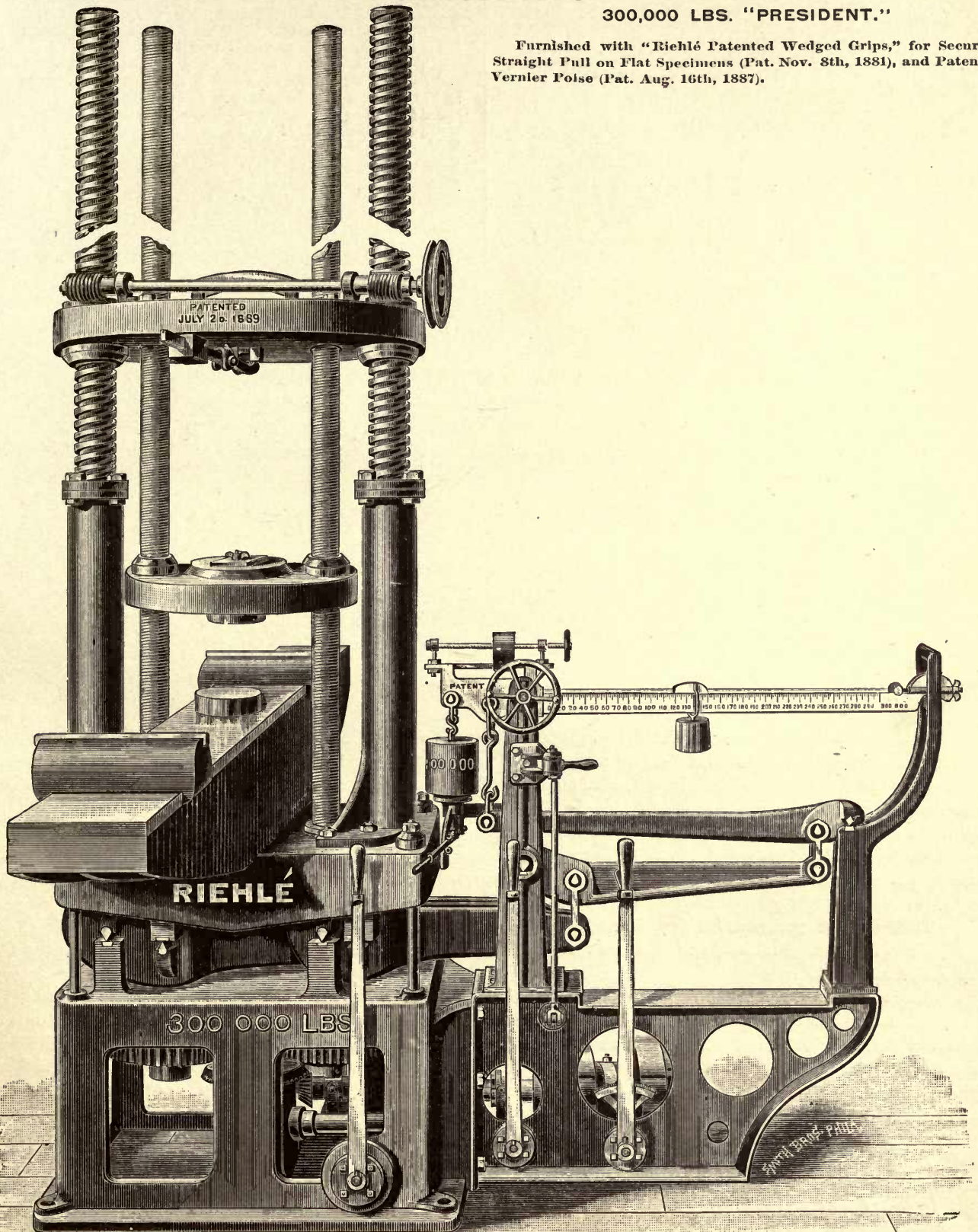


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

300,000 LBS. "PRESIDENT."

Furnished with "Riehlé Patented Wedged Grips," for Securing Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Patented Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.

Plate No. 178.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

DIMENSIONS.

Extreme Length,	11 ft.
Extreme Width,	4 "
Extreme Height,	20 "
Net Weight,	20,000 lbs.
Shipping Weight,	21,945 "

ADAPTATION.

Round Specimens,	2 in. in diameter and less.
Square "	2 in. and less.
Flat "	4 in. by 1 in. and less.
Transverse "	3 ft. long down to 12 in.
" "	12 in. wide and 24 in high.
Compression "	6 ft. by 12 in. round or square.
" Tools,	8 in. diameter, with steel centres.
Motion of Pulling Head,	8 ft.

Tensile Specimens, 6 ft. down to 8 in. in length, in the clear length of breaking section, with over 25 per cent. elongation for 6 ft. specimens, or more for shorter ones.

By an extra Transverse Table specimens 18 ft. long can be subjected to bending strain up to 100,000 lbs.

This machine has a total of eight speeds; two adjusting speeds and six different speeds, by which a specimen can be stretched or broken, also four for driving in opposite directions.

Speed for Setting and Tests (100 pulley revolutions) 5 1/3 in. per minute.

Quick Speed for Testing, 1 1/3 in. per minute.

Minimum Speed for Testing, 1 in. in 10 minutes.

Reverse Maximum Speed, 5 1/3 in. per minute.

Minimum Reverse Speed, 1 in. in 2 minutes.

Intermediate Reverse Speed, 1 1/2 in. and 2 in. per minute.

Intermediate Speeds for Testing, 1 in. in 3 minutes, 1 in. in 4 minutes, also 1 in. in 1 and 1 in. in 2 minutes.

NOTE.—For rapid testing the number of pulley revolutions may be increased.

This machine weighs the strain exerted on test specimens from 10 lbs. up to 300,000 lbs; 100,000 lbs. is put on the beam, and the balance by standard weights.

This style of machine can be arranged with tools for applying strain by tensile, transverse, and compression tests on all kinds of materials that can be subjected to such strains, and for tensile strains for specimens of chain, wire, hemp rope, bridge bolts, boiler plate, and similar articles.

By different appliances many varied and special forms can be tested, and designs can be submitted for producing various tests when called upon to do so.

Telegraph.		
President,	CAPACITY, 300,000 lbs,	PRICE, \$
Indicator.	Indicator for Elastic Limit, extra, net,	" \$
Ordnance.	Sets of Grips and Holders for Government, Ordnance, and Navy Specimens, extra,	" \$
Recording.	Recording Dial can be furnished, extra,	" \$
Callahan.	Extra Transverse bed, 18 ft. long, up to 100,000 lbs.,	" \$
Cardinal.	Ball Joint Grips, extra,	" \$

DESCRIPTION.

This illustration is of a Riehlé U. S. Standard Screw-Power Testing Machine of 300,000 lbs. capacity. We believe no other testing machine is furnished with as wide a range of testing facilities for a great variety of specimens, as this machine will pull bars 6 ft. in length, with an elongation of 3 ft.; will crush columns 6 ft. in height, and bend timbers or other transverse specimens 18 ft. long. The chief new feature about the present machine is the use of double adjustable cross-heads, both moved by power, which enables the operator to work conveniently on any length of specimens from 6 in. to 6 ft., as each head can be brought to the easiest spot for handling. This machine is very easily controlled by levers, has eight different speeds, and can be reversed at will. The gears are all cut and the machine runs very smoothly and quietly.

The length of specimens for Tension and Compression strains can be increased to 10 ft. at an extra cost.

Much of the material is of cast steel and steel castings; bronze nuts are used, and the best workmanship and finish employed throughout.

A new quick lever device for throwing in the friction driving gear has been introduced, and is much liked.

The beam has the Riehlé Patented Traveling Vernier Poise, and the calculations have been so made that the counterweight of the beam has been used as a standard weight also, and is raised in the same manner as the weights of the Emery Machine. This feature is much appreciated. In this machine is used a Riehlé Patented High Faced Wedge Grip, by the use of which it is claimed that flat specimens of materials such as boiler-plate, etc., can be tested in a direct line to the centre of specimen and without the possible tendency to tear from the edge.

The High Faced Wedges engage themselves first through the axial line of specimen and from that line outward.

Altogether, this machine is deemed a very successful appliance, and we are quite sure that it will become universally adopted where such an appliance is needed.

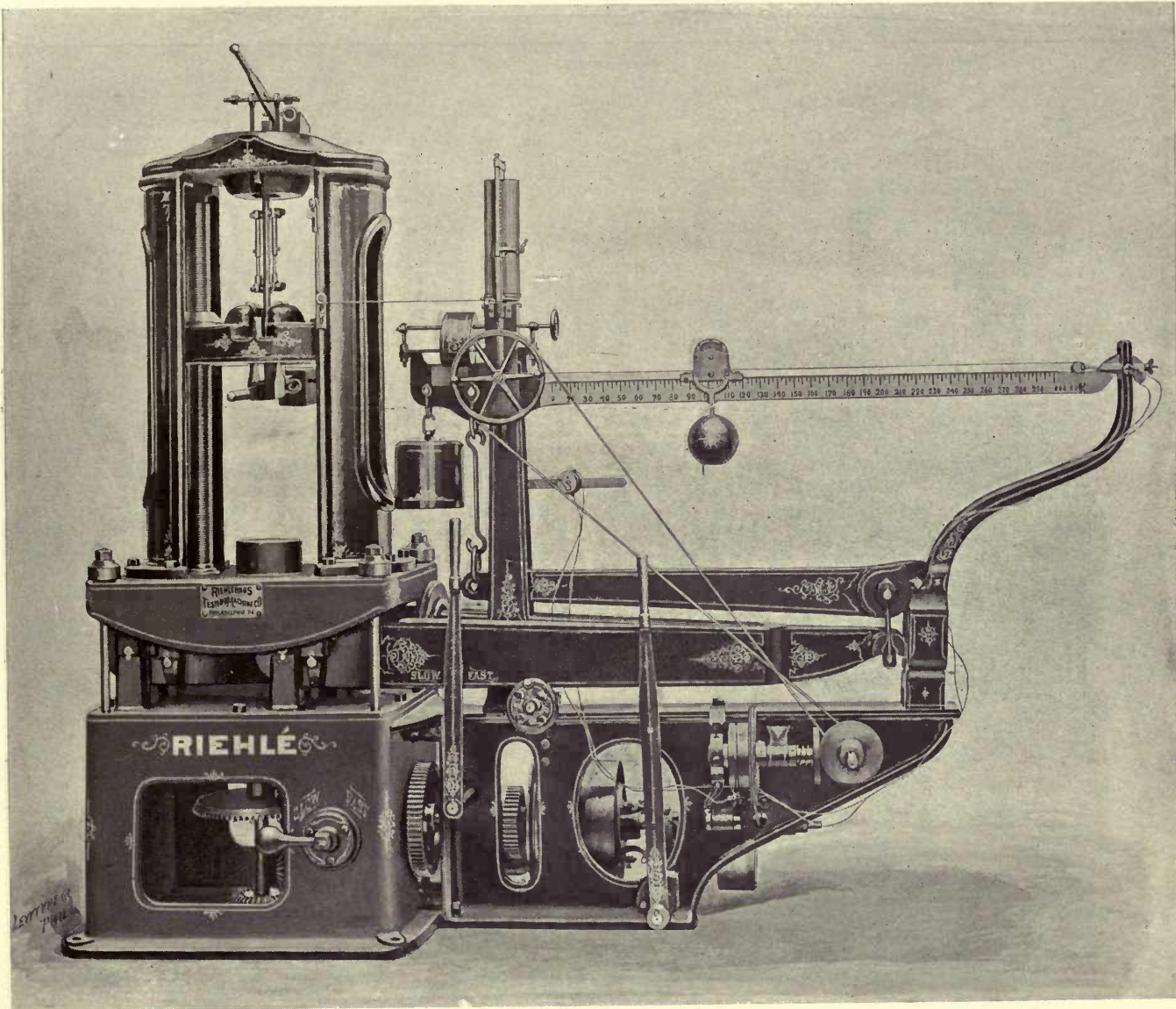
A machine of this type, of 200,000 lbs. capacity, was built for the School of Practical Science, Toronto, Canada. A Testing Machine, of 300,000 lbs. capacity, is now being built for the Riehlé Testing Laboratory, at the works of Riehlé Bros. Testing Machine Co., Ninth, above Master Street, Philadelphia.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD "AUTOMATIC AND AUTO-GRAPHIC TESTING MACHINE."

150,000 LBS. "COLONIAL."



Riehle-Buzby Electric Automatic Weighing Beam, Patented

"Nonpareil" Automatic Card Attachment. (See Plate 230, Folio 21.) Patented July 12th, 1894.

Testing Machines Patented July 2d, 1889.

Plate 287.

## DESCRIPTION AND OPERATION.

The adaptation, also the number of speeds in this Machine are fully described under Plate 154, Folios 11 and 12.  
It is a lighter Machine than Plate 282.

**RIEHLÉ BROS. TESTING MACHINE CO.**

Works, Ninth and Master Sts., Philadelphia.

Office and Store, 19 N. Sixth St., Philadelphia.

93 Liberty St., New York.

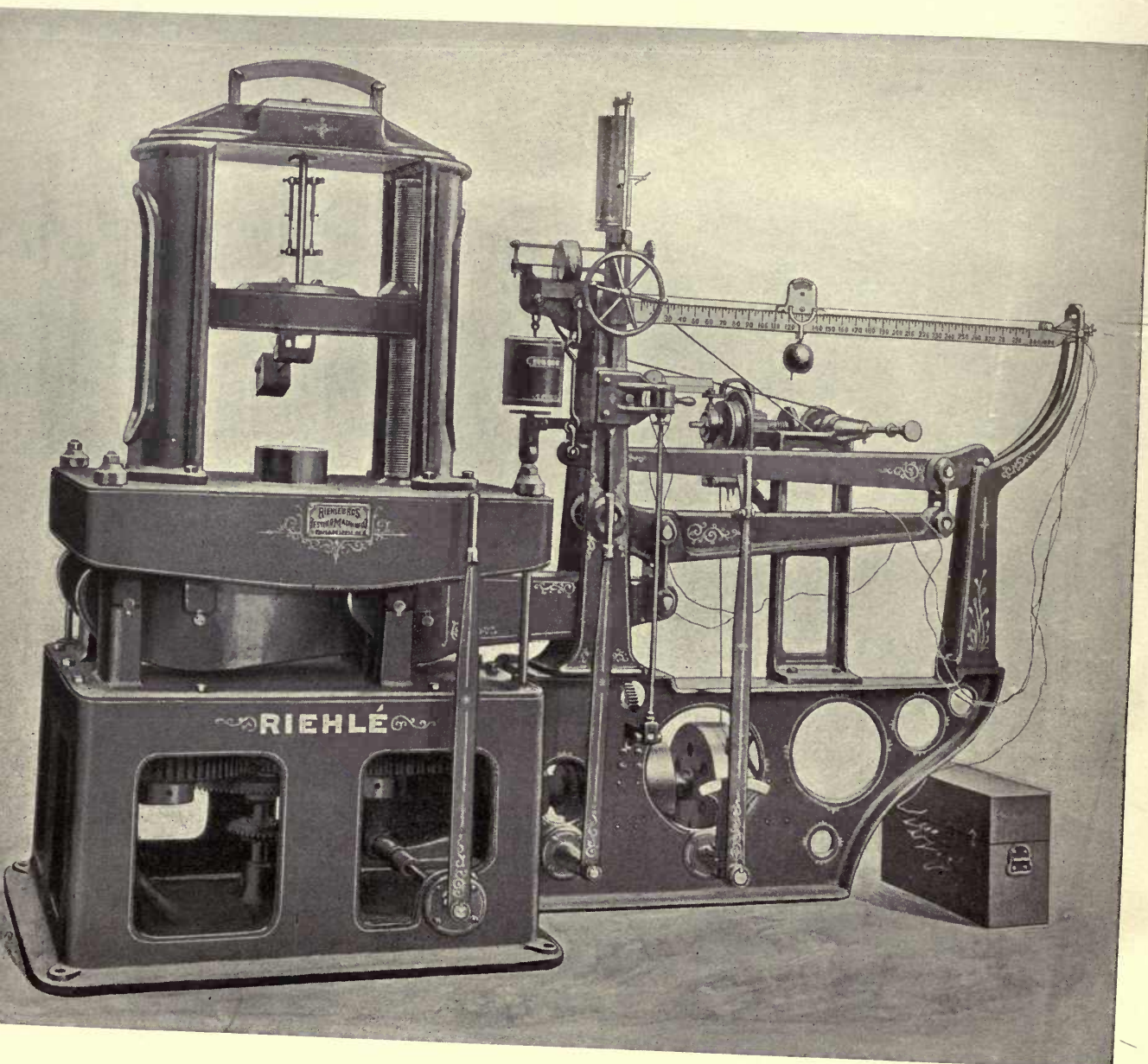


Supplementary Sheet 10a, Catalogue No. 3, Vol. 1. To Follow Folio 10.

RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD "AUTOMATIC AND AUTO-GRAPHIC TESTING MACHINE."

200,000 LBS. "AMERICA."



Riehle-Buzby Electric Automatic Weighing Beam, Patented  
"Nonpareil" Automatic Card Attachment. (See Plate 230, Folio 21.) Patented July 12th, 1894.  
Testing Machine, Patented July 2d, 1889.

Plate No. 282.

## DESCRIPTION AND OPERATION.

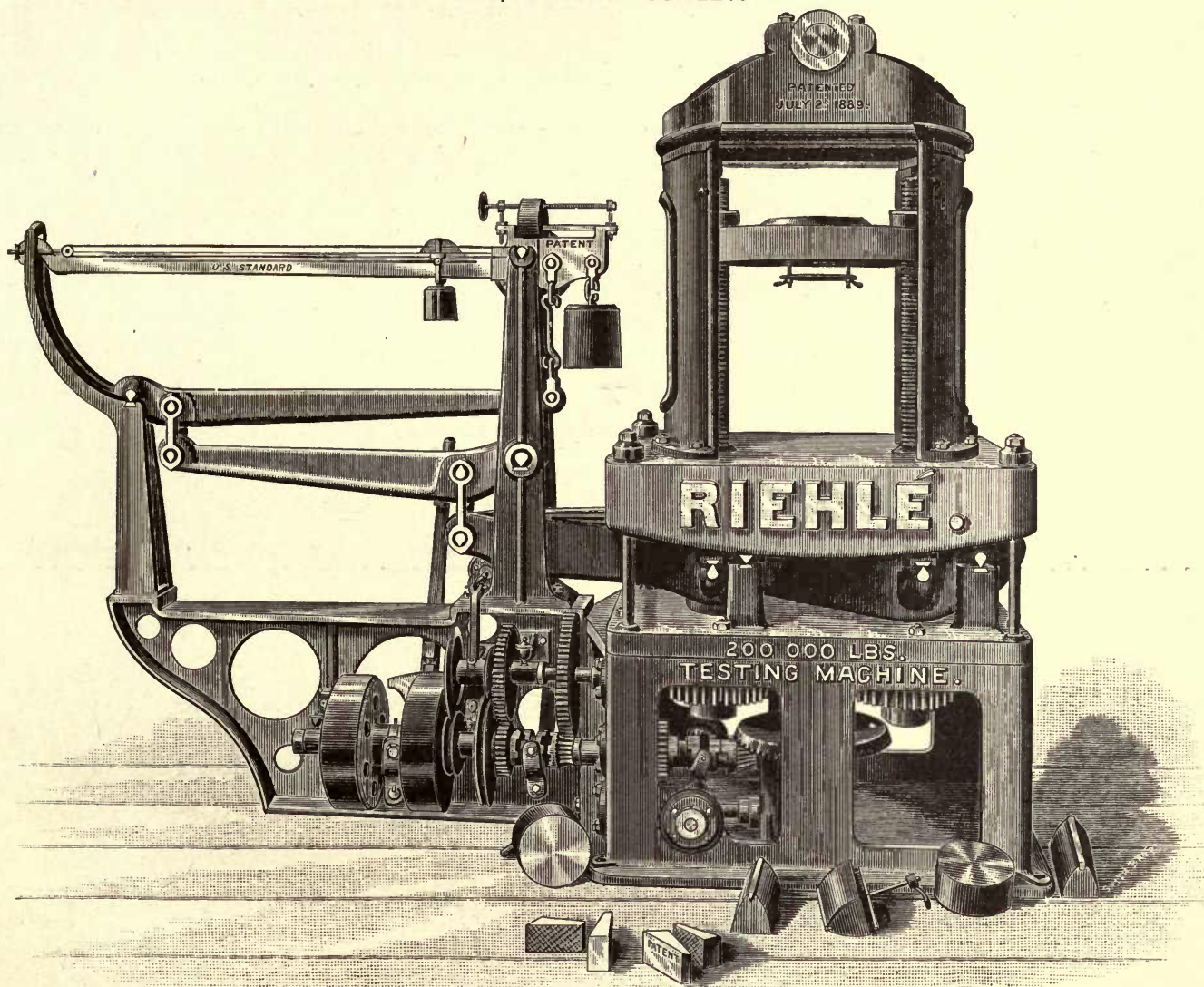
The dimensions and adaptation, also the number of speeds in this Machine are fully described under Plate 154, Folios 11 and 12.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

200,000 LBS. "SCHLEY."



Patented July 2d, 1889.

Plate No. 154.

The description of the large 300,000 lbs. Machine (Plate No. 178) will apply to this Machine, excepting that it is not so heavy, and has not the double movable head arrangement and screw columns.

## DIMENSIONS.

Extreme Length, . . . . .	11 ft.
Extreme Width, . . . . .	4 ft.
Extreme Height, . . . . .	8 ft. 6 in.
Net Weight, . . . . .	10,000 lbs.
Shipping Weight, . . . . .	10,500 lbs.

## ADAPTATION.

Round Specimens, . . . . .	2 in. in diameter and less.
Square " . . . . .	2 in. and less.
Flat, " . . . . .	3 1/2 in. by 1 in. and less.
Transverse " . . . . .	36 in. long down to 12 in.
Transverse Tools, . . . . .	12 in. wide and 24 in. high.
Compression Specimens, . . . . .	12 in. round or square.
" Tools, 8 in diameter, with 3 in. steel centres.	
Motion of Pulling Head, . . . . .	30 in.

Tensile Specimens 24 in. down to 8 in. in length, in the clear length of breaking section, with 25 per cent. elongation for 24 in. specimens, or more for shorter ones.

## SPEEDS.

This machine has a total of eight speeds; two adjusting speeds and six different speeds, by which a specimen can be stretched or broken, also four for driving in opposite directions.

Speed for Setting and Tests (100 pulley revolutions), 5 1/3 in. per minute.

Quick Speed for Testing, . . . . . 1 1/2 in. per minute.

Minimum Speed for Testing, . . . . . 1 in. in 10 minutes.

Intermediate Speeds for Testing, 1 in. in 3 minutes, 1 in. in 4 minutes, also 1 in. in 1 and 1 in. in 2 minutes.

Reverse Maximum Speed, . . . . . 5 1/3 in. per minute.

Minimum Reverse Speed, . . . . . 1 in. in 2 minutes.

Intermediate Reverse Speed, 1 1/2 in. and 2 in. per minute.

NOTE.—For rapid testing the number of pulley revolutions may be increased. In use by (see folios 3, 4, 5, and 6; paragraphs 1, 2, 4, 13).



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## 200,000 LBS. U. S. STANDARD TESTING MACHINE, Continued.

### DESCRIPTION.

This machine weighs the strain exerted on test specimens from 10 lbs. up to 200,000 lbs.; all the weight can be put on the beam, or any part that may be preferred.

This style of machine can be arranged with tools for applying strain by tensile, transverse, and compression tests on all kinds of materials that can be subjected to such strains, and for tensile strains for specimens of chain, wire, hemp rope, bridge bolts, boiler plate, and similar articles.

By different appliances many varied and special forms can be tested, and designs can be submitted for producing various tests when called upon to do so.

Telegraph.	
Schley.	Capacity, 200,000 lbs. Price, . . . . . \$
Indicator.	Indicator for Elastic Limit, extra, net. Price, . . . . . \$
Ordinance.	Sets of Grips and Holders for Government, Ordnance, and Navy Specimens, extra. Price, \$
Recording.	Recording Dial can be furnished, extra. Price, . . . . . \$
Cardinal.	Ball Joint Grips, extra. Price, . . . . . \$

### IN USE BY.

EDGAR THOMSON STEEL WORKS, . . . . .	Braddock, Pa.	GREAT NORTHERN RAILWAY, . . . . .	St. Paul, Minn.
BURDEN IRON WORKS, . . . . .	Troy, N. Y.	U. S. NAVY YARD, . . . . .	Boston, Mass.
R. W. HUNT & Co., ENGINEERS, . . . . .	Chicago, Ill.	THOMSON-HOUSTON ELECTRIC CO., . . . . .	Lynn, Mass.
WALDO & STOUT, . . . . .	Bridgeport, Conn.	AND OTHERS.	

(See folios 3, 4, 5, and 6; paragraphs 1, 2, 4, and 5.)

## THE RIEHLÉ ADJUSTABLE TRANSVERSE INDICATOR.

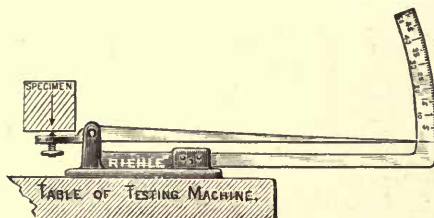


Fig. 39.

### DIMENSIONS.

Extreme Length, . . . . .	18 in.	Extreme Width, . . . . .	3 in.
Extreme Height, . . . . .	8 in.	Weight, . . . . .	20 lbs.

Telegraph.	
Indicator.	Price, . . . . . \$

### DESCRIPTION.

The Riehlé Adjustable Transverse Indicator consists of a cast-iron base, to which is attached an indicator arm of polished brass, graduated in one-tenths of an inch. At the other end of the stand is a needle-beam, proportioned to multiply the deflections ten times, so that one-tenths on graduated arm represent one-hundredths of deflection of specimen, and by noting the intervals between marks, even finer deflections can be observed.

The beam is fitted with screw adjustment for setting the needle at zero and starting the tests. This apparatus is simple and portable, and can be used on the table of any testing machine by seeing that it is properly leveled to suit height of transverse tools used. The screw should be adjusted under the transverse tool instead of under specimen, so as not to be affected by the break.

This is an ingenious device and its importance to those investigating the elasticity of specimens under transverse strain is apparent, and by its use the deflections can be measured with ease and quickness.

An apparatus of this kind can be made in several sizes, suited for the largest as well as the smallest testing machine. The one we have shown in this illustration was made for the Dennis Long Company, Louisville, Ky.

Extract of letter, Carbon Iron Co., Pittsburgh, Pa.—“We will report favorably to any one you might refer to us about the 100,000 lbs. Testing Machine we have of your make.”

Extract of letter, S. H. Peabody, Pres. Univ. of Illinois, Champaign, Ill.—“Your 100,000 lbs. U. S. Standard Testing Machine gives perfect satisfaction.”

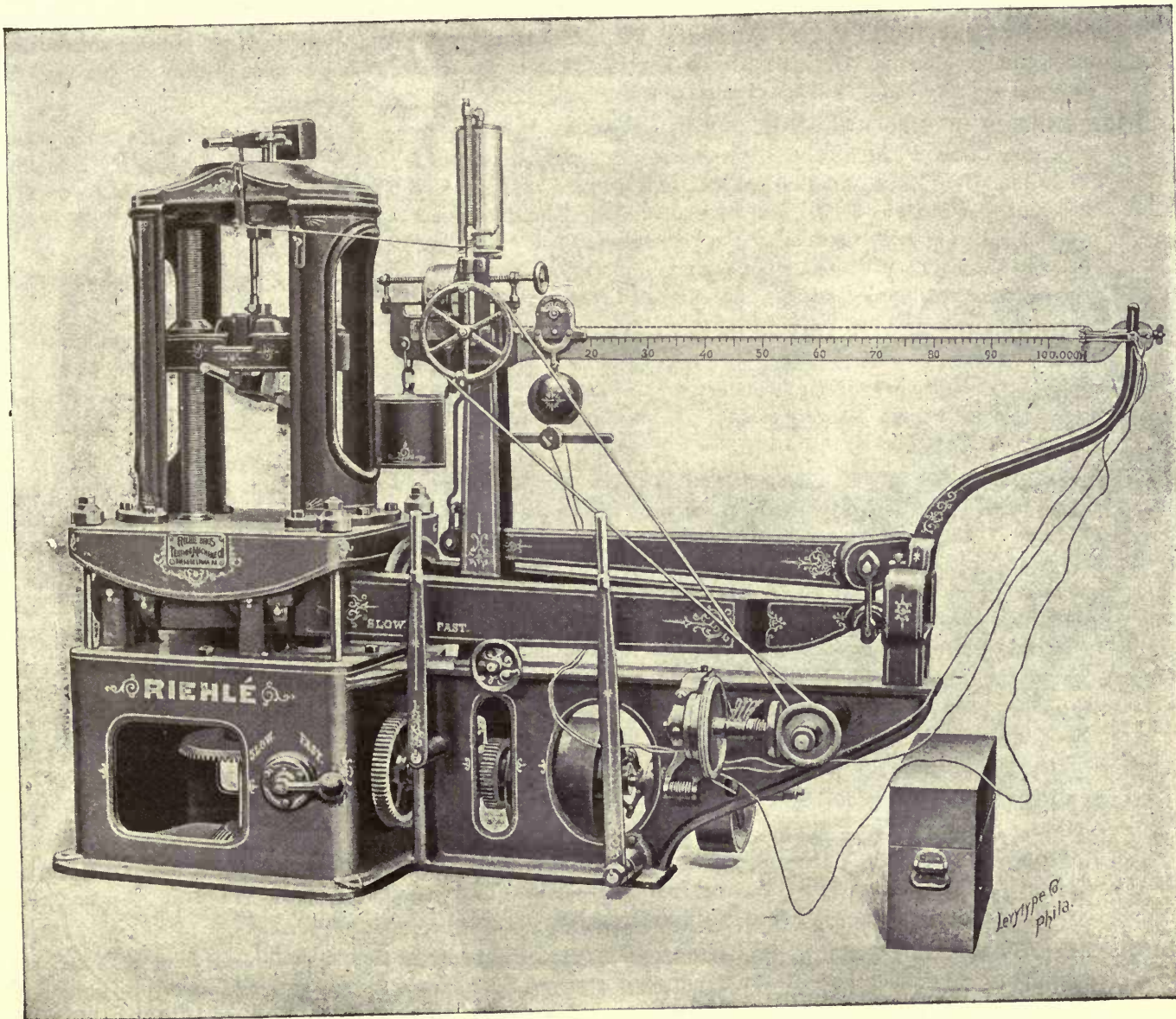


Supplementary Sheet, 12aa, Catalogue No. 3, Vol. I. To follow folio 12a.

RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ U. S. STANDARD "AUTOMATIC AND AUTOGRAPHIC TESTING MACHINE."

100,000 LBS. "LIBERTY."



Riehlé-Buzby Electric Automatic Weighing Beam, Patented November 13th, 1894.  
"Nonpareil" Automatic Card Attachment. (See Plate 230, folio 21.) Patented July 12th, 1894.  
Testing Machines Patented July 2d, 1889.

Plate No. 288.

### DESCRIPTION AND OPERATION.

Please see Supplementary sheets, A, B, and C, in this Catalogue following folio 72.

The adaptation, also the number of speeds in this Machine are fully described under Plate 236, folios 13 and 14.





## NEW TESTIMONIALS ABOUT RIEHLÉ U. S. STANDARD TESTING MACHINES.

**CORNELL UNIVERSITY, College of Civil Engineering, Ithaca, N. Y., October 1st, 1894.** Director E. A. **Fuertes.** "It gives me pleasure to state that the new 400,000 lbs. Riehlé U. S. Standard Testing Machine purchased from you seems to be in every respect what is desired as to STRENGTH, COMPACTNESS, AND EASE OF MANIPULATION."

**DEPARTMENT OF MECHANICAL ENGINEERING, School of Mines, Columbia College, New York City, February 12th, 1894.** Prof. F. R. **Hutton.** "You will permit me to thank you for your interest (in leading to the College acquiring a Testing Machine), which has taken so practical a shape, and express in this my appreciation."

**THE McCONWAY & TORLEY CO., Pittsburg, Pa., November 23d, 1894.** "It gives us pleasure to say that the RIEHLÉ 100,000-LB. U. S. STANDARD TESTING MACHINE purchased from you some months ago has been in daily use since we had it, and has given us satisfaction."

**LABORATORIES OF DR. GIDEON E. MOORE, Dept. of Physical Tests, New York, November 30th, 1894.** Director, Chas. F. **McKenna.** "I respond with pleasure to your request for my opinion as to the merits of the RIEHLÉ U. S. STANDARD TESTING MACHINE, 100,000 LBS. CAPACITY, built by you for this establishment. The machine shows in all its details, and especially in the important one of the finish and adjustment of the knife-edges and bearings, workmanship of the highest order.

"In the matter of ACCURACY, DURABILITY, AND READY ADAPTABILITY, it is high praise to say it has met satisfactorily the exacting requirements of this laboratory, and this I cheerfully do."

**LABORATORIES OF BOOTH, GARRETT & BLAIR, 406 Locust Street, Philadelphia, Pa., December 18th, 1894.** "We are very much pleased with the 'COLUMBIA' machine which you have furnished us, and which has proven very satisfactory for our laboratory work. The new automatic beam rigging which you have recently put on the machine we also like very much; it is, we think, the best thing of the kind we have seen." (Plate 236, Folio 13.)

**STATE COLLEGE OF KENTUCKY, School of Mechanical Engineering, Lexington, Ky., December 28th, 1894.** Prof. F. Paul **Anderson.** "Two years ago we purchased from you a RIEHLÉ U. S. STANDARD TESTING MACHINE OF 100,000 LBS. CAPACITY 'COLUMBIA' (Plate 236, Folio 13). It has given excellent satisfaction and has proved itself reliable. We have had occasion to run the machine 25 per cent. above the rated capacity without apparent injury.

"THE RIEHLÉ U. S. STANDARD CEMENT TESTING MACHINE, 1,000 LBS. CAPACITY (Plate 14, Folio 57), purchased of you last July is accurate and easy to manipulate."

**PENN STEEL CASTING AND MACHINE CO., Chester, Pa., December 29th, 1894.** Frederick **Baldt, Manager.** "THE RIEHLÉ U. S. STANDARD TESTING MACHINE 'PHILADELPHIA,' 100,000 LBS. CAPACITY, furnished by you to this Company (Plate 34, Folio 17), has been in constant use for the past two years and three months, and has given excellent satisfaction, and we take pleasure in recommending it."

**DEPARTMENT OF PUBLIC WORKS, Peoria, Ill., December 18th, 1894.** Jacob A. **Harman, City Engineer.** "For the past year we have had in use in our CITY LABORATORY one of your VERTICAL SCREW-POWER TESTING MACHINES OF 100,000 LBS. CAPACITY, for Tension, Transverse, and Compression Strains (RIEHLÉ TESTING MACHINE 'COLUMBIA,' Plate 236, Folio 13); also a RIEHLÉ U. S. STANDARD CEMENT TESTING MACHINE OF 2,000 LBS. CAPACITY (Plate 14, Folio 57); both of which have given PERFECT SATISFACTION."

**SHOENBERGER & CO., Pittsburg, Pa., Huldreth Weber, Engineer of Tests.** "While I have absolutely no complaint to make about the TESTING MACHINE, it is against the rules and custom of our Company to issue any letters of this character." (Riehlé Automatic and Autographic U. S. Standard Testing Machine 'Liberty,' Plate 288).

**J. PAINTER & SONS CO., Pittsburg, Pa., December 31st, 1894.** "We are pleased to say in reference to the RIEHLÉ U. S. STANDARD 20,000 LBS. TESTING MACHINE (Plate 10, Folio 43), you furnished us some time ago, that it has proven eminently satisfactory for our purpose, viz.: the determination of tensile strength, etc., of our specialties Hoops and Bands, and we therefore take pleasure in giving the RIEHLÉ TESTING MACHINE our highest approval."

### RIEHLÉ BROS. TESTING MACHINE CO.

Works, Ninth and Master Sts., Philadelphia.

Office and Store, 19 N. Sixth St., Philadelphia.

93 Liberty St., New York.

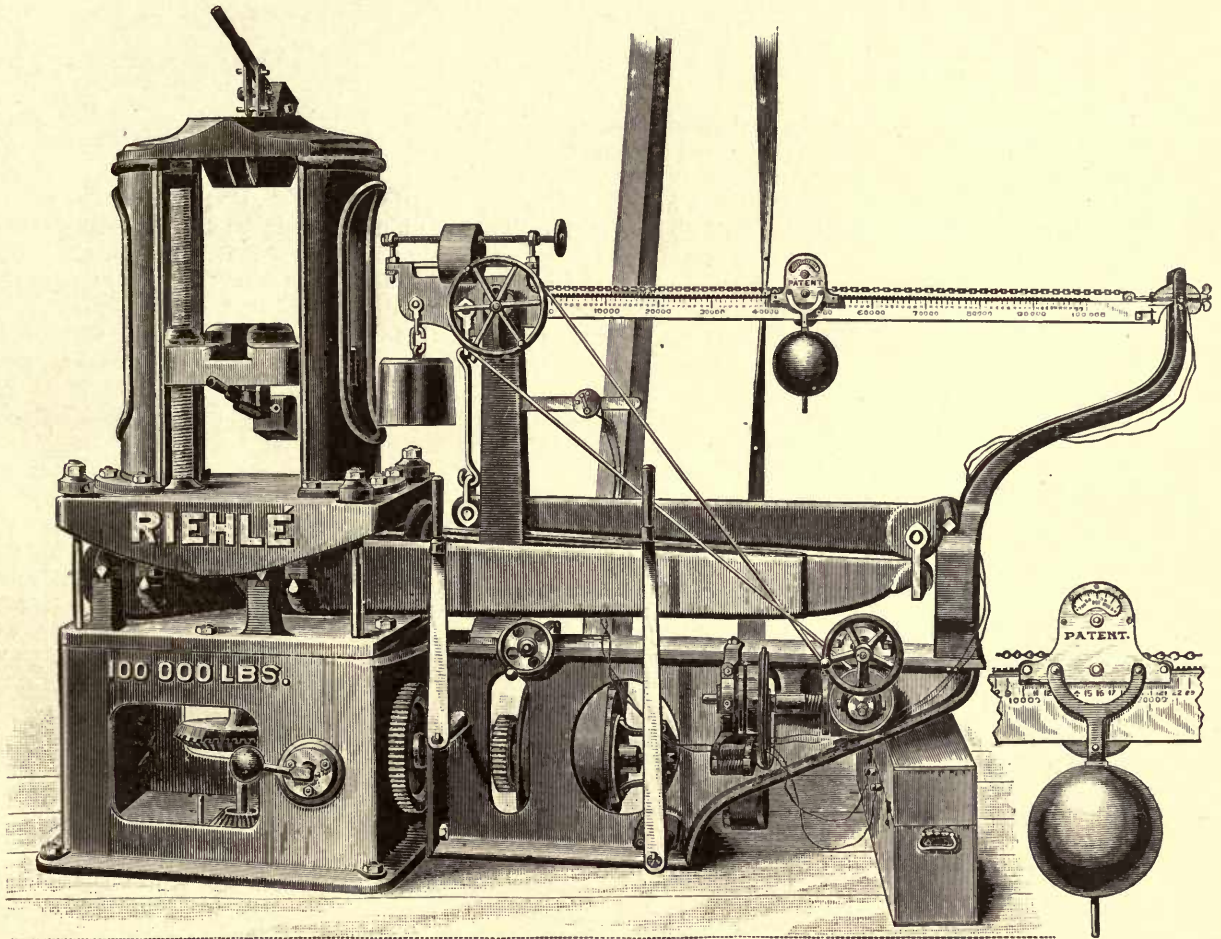


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

100,000 LBS. "COLUMBIA."

Furnished with "Riehlé Patented Wedge Grips" (Pat. Nov. 8th, 1881), for securing a straight pull on Flat Specimens, and Riehlé-Buzby Patented Electric Automatic Weighing Beam.



Patented July 2d, 1889.

Plate No. 236.

## DIMENSIONS.

Extreme Height, . . . . .	6 ft
Extreme Length, . . . . .	9 ft. 3 in.
Extreme Width, . . . . .	2 ft. 9 in.
Weight, . . . . .	4,800 lbs.
Shipping Weight, . . . . .	5,000 lbs.

## ADAPTATION.

Tensile Specimens, 2 ft. long or less, with 25 per cent. elongation for 2-ft. specimens, or more for shorter ones.	
Round Specimens, . . . . .	2 in. diameter or less.
Square " . . . . .	2 in. square or less.
Flat " . . . . .	3 in. x 1 in. or less.
Transverse Specimens, . . . . .	2 ft. or less to 6 in. long.
Compression " . . . . .	2 ft. long or less.
" Surfaces, . . . . .	4 in. in diameter.

Motion of Pulling Head, . . . . .	2 ft.
Six different speeds, with which a specimen can be stretched or broken, and four for driving in the opposite direction. The speeds of the "COLUMBIA" Machine, at 150 revolutions of the Pulleys, are as follows;	
Slowest Speed, using Friction, . . . . .	$\frac{1}{9}$ in. per minute.
Quick " " " . . . . .	$\frac{1}{4}$ in. "
Slow " " Lever, . . . . .	$\frac{3}{4}$ in. "
Quick " " " . . . . .	1 $\frac{1}{2}$ in. "
Quickest " " " . . . . .	8 in. "

For tests of Low Ultimate Strength, the Back Gear can be used in the Quick Speed, giving additional Speeds of

Slow Friction, . . . . .	$\frac{1}{2}$ in. per minute.
" Lever, . . . . .	4 in. "

The Reverse Speeds are the same as above, except that no Friction Speeds can be used. They are not necessary.

NOTE.—This Machine can be run up to double this speed, if required for very rapid Testing.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

### DESCRIPTION OF 100,000 lbs. RIEHLÉ "COLUMBIA" TESTING MACHINE, continued from previous page.

This style of Testing Machine is made in 60,000 lbs., 100,000 lbs., 150,000 lbs., and 200,000 lbs. Capacity

*Telegraph.*

Columbia, . . . . . CAPACITY, 100,000 lbs. . . . . PRICE, \$

Special appliances noted in connection with Plate Nos. 178, 154, and 34 furnished with this Machine, if ordered. Refer to them by Telegraph code.

This new and handsome type of Machine represents all our latest improvements in the line of convenient, rapidly-adjusted, and automatic Testing Machines. The open heads admit of quick insertion of specimens. The counterbalanced levers hold and adjust the grips in the most convenient manner.

The Levers are a handy method of controlling and reversing direction of the tool-holders, and for elastic limit tests the Friction Wheels are most valuable.

The Electric Automatic Beam is a new and handsome type, by which the thousand pounds are read on the main beam, and the hundred down to ten pounds on a dial carried on the poise itself, and revolved by means of cut gears and rack inserted on the top of main beam. This poise is moved by electricity, and will advance as the beam arises, the latter making the electric circuit, which acts through a magnet to draw in a friction clutch, that thus drives the pulley communicating its motion to the beam hand-wheel. There is also, in connection with this driving apparatus, two discs, the periphery of one driving against the face of the other by spring pressure. The motion of one of these discs is controlled by a hand-wheel and screw so as to pass across the face of the other. The mechanic will thus see that we have at once a variable speed as the driven gear approaches the centre of the driver, and that when it passes the centre we have the motion reversed, all of which is used conveniently in automatic weighing. In connection with the beam, there is also a sliding gib traveling along the bottom of the beam, and secured to the hanger of the poise. This prevents jumping of the poise out of gear from recoil.

The most desirable method of operating the Machine seems to be just as performed by this remarkable device, as follows: When the specimen is set and the pressure started, the discs are placed on the proper side of the centre, and at the speed distance, known by practice to be correct, and the beam then weighs automatically to the point of rupture and there stops. The disc movement is now reversed and a separate switch lever is thrown in circuit, which runs the poise back until a projection on this poise strikes the switch lever and breaks the circuit. This can be at zero, or by sliding the switch along a bar under the beam, the poise can be stopped at any point the operator desires. He can operate this beam and poise by hand when preferred. This Testing Machine, as in fact all of our larger ones, can be arranged with the NONPAREIL AUTOMATIC CARD ATTACHMENT, PLATE No. 230, RIEHLÉ-PACIFIC FLAT CARD ATTACHMENT, PLATE No. 221, or RIEHLÉ-GRAY AUTOMATIC WEIGHING AND RECORDING ATTACHMENT, PLATE No. 229, as desired.

(For names of parties using Riehlé Testing Machines, please see folios 3, 4, 5, and 6 of this book; paragraphs 1, 2, 4, 5, and 17.)

## RIEHLÉ-BENJAMIN EXTENSOMETER.

### DESCRIPTION.

This instrument consists of two aluminum castings which are clamped at their lower ends by hardened steel points to the test-piece. At their upper ends are two levers, one of the first power and one of the third power, each with a bearing point of hardened steel directly above and eight inches from the lower clamping point on that side.

A trammel is used for prick-punching the specimen so that when the four points of the extensometer are placed in the punch-marks and clamped up the indicator points to zero.

The two levers above mentioned are about twelve inches in length and extend horizontally from the clamping device. One lever carries a scale the other a pointer, and owing to the different leverage as the specimen elongates, the scale moves downward while the pointer moves upward, thus doubling the leverage as applied to the reading.

The instrument reads readily to thousandths or ten-thousandths.

The outfit consists of the instrument proper, the trammel bar, and points for prick-punching, and a distance collar for proving the accuracy and adjustment of the extensometer.

Instruments are made for other sizes than eight inches, viz.—four inches and six inches.

*Telegraph.*

BENJAMIN. Price, . . . . . \$

### IN USE AT

CASE SCHOOL OF APPLIED SCIENCE, PROFESSOR C. H. BENJAMIN, . . . . . Cleveland, Ohio.

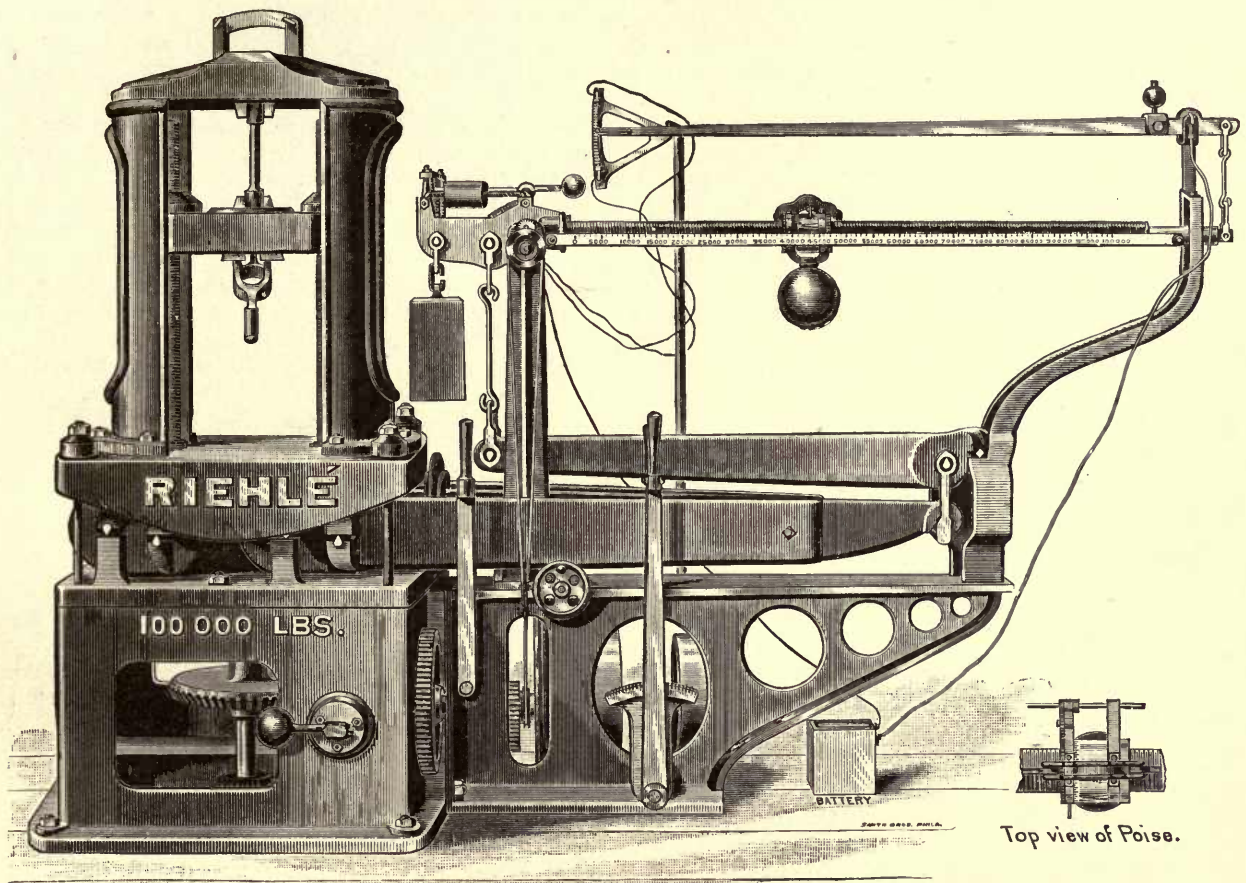


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

100,000 LBS. "CROWN."

Furnished with "Riehle Patented Wedge Grips" (Pat. Nov. 8th, 1881), for securing a straight pull on Flat Specimens, and Riehle-Reeser Patented Electric Automatic Screw Weighing Beam (Pat. March 21st, 1893).



Patented July 2d, 1889.

Plate No. 237.

## DIMENSIONS.

Extreme Height, . . . . .	6 ft
Extreme Length, . . . . .	9 ft. 3 in.
Extreme Width, . . . . .	2 ft. 9 in.
Weight, . . . . .	4,800 lbs.
Shipping Weight, . . . . .	5,000 lbs.

## ADAPTATION.

Tensile Specimens, 2 ft. long or less, with 25 per cent. elongation for 2-ft. specimens, or more for shorter ones.	
Round Specimens, . . . . .	2 in. diameter or less.
Square " . . . . .	2 in. square or less.
Flat " . . . . .	3 in. x 1 in. or less.
Transverse Specimens, . . . . .	2 ft. or less to 6 in. long.
Compression " . . . . .	2 ft. long or less.
" Surfaces, . . . . .	4 in. in diameter.

Motion of Pulling Head, . . . . . 2 ft.  
Six different speeds, with which a specimen can be stretched or broken. and four for driving in the opposite direction. The speeds of the "Crown" Machine, at 150 revolutions of the Pulleys, are as follows;  
Slowest Speed, using Friction, . . . . .  $\frac{1}{10}$  in. per minute.  
Quick " " " . . . . .  $\frac{1}{4}$  in. "  
Slow " " Lever, . . . . .  $\frac{3}{4}$  in. "  
Quick " " " . . . . .  $1\frac{1}{2}$  in. "  
Quickest " " " . . . . . 8 in. "  
For tests of Low Ultimate Strength, the Back Gear can be used in the Quick Speed, giving additional Speeds of  
Slow Friction, . . . . .  $\frac{1}{2}$  in. per minute.  
" Lever, . . . . . 4 in. "  
The Reverse Speeds are the same as above, except that no Friction Speeds can be used. They are not necessary.  
NOTE.—This Machine can be run up to double this speed, if required for very rapid Testing.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

### DESCRIPTION OF 100,000 lbs. RIEHLÉ "CROWN" TESTING MACHINE, continued from previous page.

This style of Testing Machine is made in 60,000 lbs., 100,000 lbs., 150,000 lbs., and 200,000 lbs. Capacity.

*Telegraph.*

Crown, . . . . . CAPACITY, 100,000 lbs. . . . . PRICE, \$

The RIEHLÉ-CROWN TESTING MACHINE is constructed in precisely the same manner as Plate No. 34 or No. 236, immediately preceding, excepting as to the beam arrangement. On this Machine is used the Riehlé-Reeser Electric Automatic Screw Beam. This is a very complete automatic weighing apparatus, which, while it follows the strain, either increasing or decreasing, will leave a register of the maximum load placed on the test specimen. The patents of this beam cover the principle of a fixed screw beam with a revolving nut or poise; the circumference of this poise is graduated by ten pounds up to 1,000 lbs., for each revolution corresponding to the pitch of the screw. The 1,000 pound marks are read from an Indicator on the side beam, and the hundreds on the poise adjacent. The poise runs forward or back by means of two sets of miters and friction clutches, which being on opposite sides of the first driver take opposite directions.

These clutches are operated by means of a magnet and battery, the wires of which are connected to a counterbalancing lever beam, which by its vibration between the poles by the rise and fall of the pressure, controls the motion of the poise to suit. The extreme travel of the poise is indicated by a very light traveler carried forward by the poise itself, and left at the furthest point, while the poise registers its revolution by a pointer which is carried in the forward direction, but is not carried backward because the joint is allowed to trip and let it pass. It is very accurate and a fine piece of workmanship. This Testing Machine, as in fact all of our larger ones, can be arranged with the NONPAREIL AUTOMATIC CARD ATTACHMENT, Plate No. 230, RIEHLÉ-PACIFIC AUTOMATIC FLAT CARD ATTACHMENT, Plate No. 221, or RIEHLÉ-GRAY AUTOMATIC WEIGHING AND RECORDING ATTACHMENT, Plate 229, as desired.

(For names of parties using Riehlé Testing Machines, please see folios 3, 4, 5, and 6 of this book; paragraphs 1, 2, 4, 5, and 17.)

## RIEHLÉ-CARPENTER EXTENSOMETER.

### DESCRIPTION.

This style of Extensometer was designed by Professor Carpenter of Cornell University. It is furnished with self-centering V guides in connection with the adjusting points, and these points also have spring pressure back of them to take up any reduction of specimen.

It has gauge clamps to adjust the length which can be swung loose after the apparatus is set. A pair of Brown & Sharpe Micrometer Calipers, or something of the same nature is mounted, one on each side, to take readings of extension to one ten-thousandth of an inch, and a series of guide pulleys have been arranged with a tension cord to give the ordinates representing stretch when a card diagram is being taken. Parts of this apparatus have been adopted by us in the card diagram attachment called the "Nonpareil" on another page of this catalogue.

*Telegraph.*

CARPENTER. Price, . . . . . \$

### IN USE AT

CORNELL UNIVERSITY, PROFESSOR R. C. CARPENTER, . . . . . Ithaca, New York.

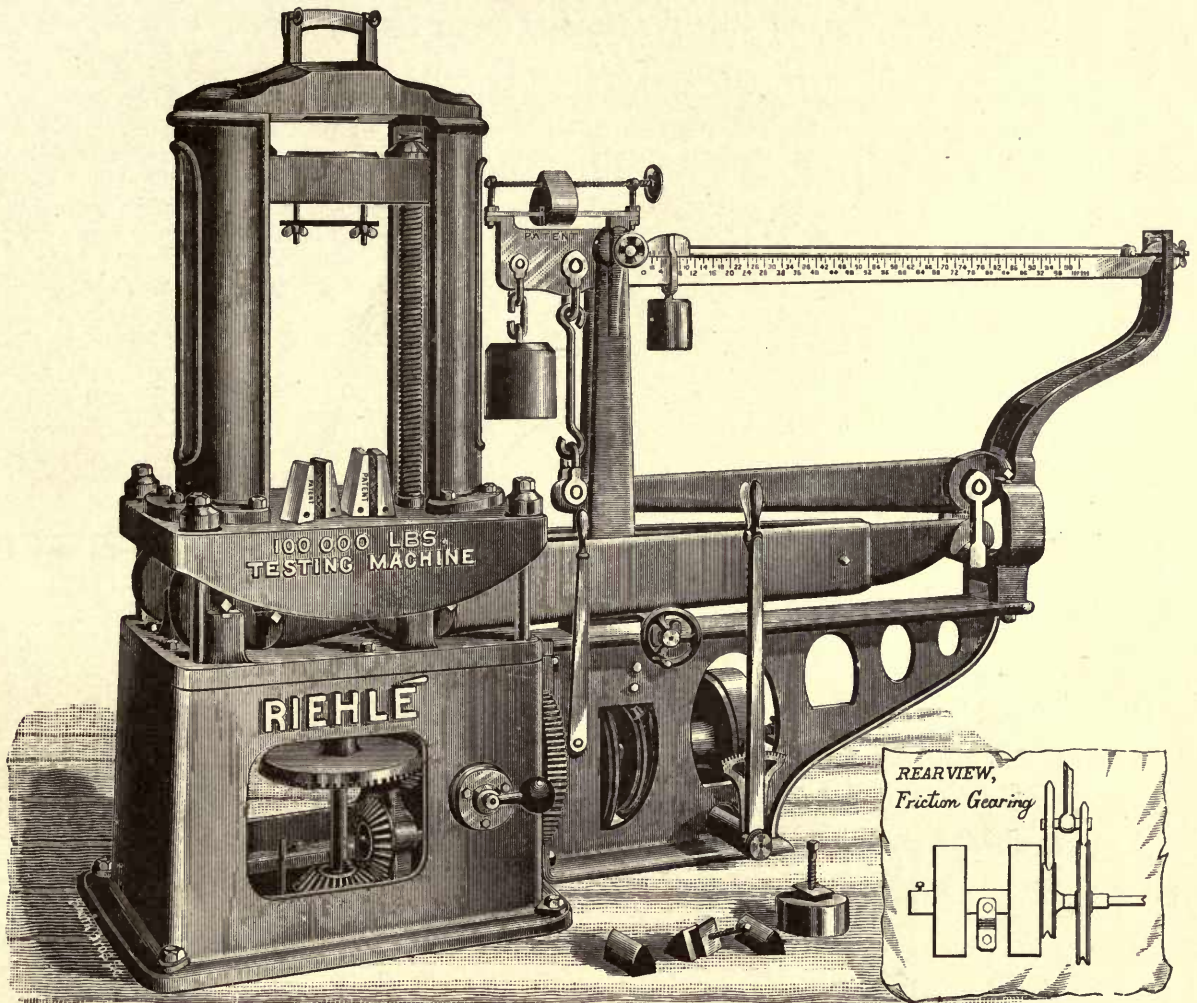


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

100,000 LBS. "PHILADELPHIA."

Furnished with "Riehlé Patented Wedge Grips" (Pat. Nov. 8th, 1881), for securing a straight pull on Flat Specimens, and Vernier Poise (Pat. Aug. 6th, 1887).



Patented July 2d, 1889.

Plate No. 34.

For description of this machine we would also refer you to Plate No. 178, excepting as to the double movable head and that it is of less size and capacity.

### DIMENSIONS.

Extreme Height, . . . . .	6 ft.
Extreme Length, . . . . .	9 ft. 3 in.
Extreme Width, . . . . .	2 ft. 9 in.
Weight, . . . . .	4,800 lbs.
Shipping Weight, . . . . .	5,000 lbs.

### ADAPTATION.

Tensile Specimens, 2 ft. long or less, with 25 per cent. elongation for 2-ft. specimens, or more for shorter ones.

Round Specimens, . . . . .	2 in. diameter or less.
Square " . . . . .	2 in. square or less.
Flat " . . . . .	3 in. x 1 in. or less.

Six different speeds, with which a specimen can be stretched or broken, and four for driving in the opposite direction.

Speeds for 100,000 lbs. Screw Power Testing Machine. (80 Pulley

Rev.) Max. Speed for Setting and Light Tests,  $3\frac{3}{4}$  in. per min.

Quick Speed for Testing,  $\frac{2}{3}$  in. per min. or 1 in. in  $1\frac{1}{2}$  mins.

Min. Speed for Testing, 1 in. in 18 mins.

Transverse Specimens, . . . . . 2 ft. or less to 6 in. long.

Compression " . . . . . 2 ft. long or less.

" Surfaces, . . . . . 4 in. diameter.

Motion of Pulling Head, . . . . . 2 ft. 4 in.

Intermediate Speeds for Testing,  $\frac{1}{8}$  in. and  $\frac{1}{4}$  in. per min. or 1 in. in 8 and 1 in. in 4 mins.

Max. Reverse Speed, . . . . .  $3\frac{3}{4}$  in. per min.

Min. Reverse Speed, . . . . .  $\frac{1}{4}$  in. per min. or 1 in. in 4 mins.

Intermediate Speed, . . . . .  $\frac{2}{3}$  in. per min. and 1 in. in  $1\frac{1}{4}$  mins.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

DESCRIPTION OF 100,000 lbs. RIEHLÉ TESTING MACHINE, continued from previous page.

This style of Testing Machine is made in 10,000 lbs., 20,000 lbs., 30,000 lbs., 40,000 lbs., 50,000 lbs., 60,000 lbs., 100,000 lbs., 150,000 lbs., 200,000 lbs., and 300,000 lbs Capacity.

Telegraph.			
Philadelphia,	CAPACITY, 100,000 lbs.	PRICE, \$	
Indicator.	Indicator for Elastic Limit, extra, net,	"	\$
Ordinance.	Sets of Grips and Holders for Government, Ordnance, and Navy Specimens, extra,	"	\$
Recording.	Recording Dial can be furnished, extra,	"	\$
Cardinal.	Ball Joint Grips, extra,	"	\$

This machine weighs the strain exerted on test specimens from 10 lbs. up to 100,000 lbs. ; all the weight can be put on the beam, or any part that may be preferred.

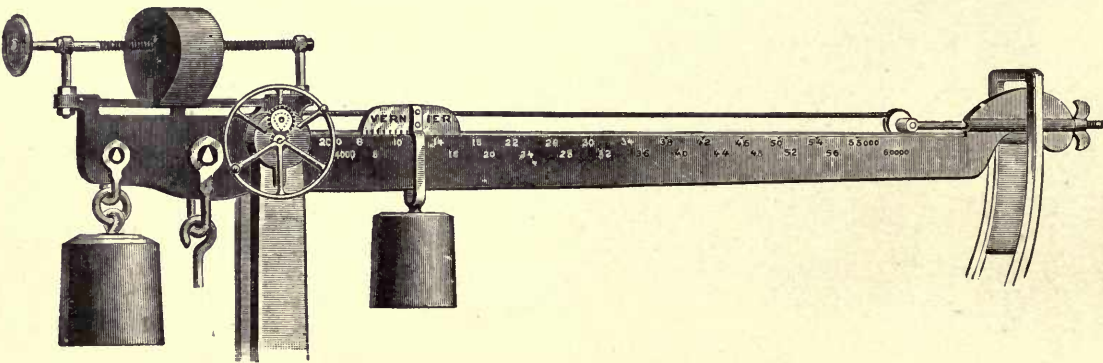
This style of machine can be arranged with tools for applying strain by tensile, transverse, and compression tests on all kinds of materials that can be subjected to such strains, and for tensile strains for specimens of chain, wire, hemp rope, bridge bolts, boiler plate, and similar articles.

By different appliances many varied and special forms can be tested, and designs can be submitted for producing various tests when called upon to do so.

(For names of parties using these machines, please see folios 3, 4, 5, and 6 of this book ; paragraphs 1, 2, 4, 5, and 17.)

NOTE.—For rapid testing the number of pulley revolutions may be increased.

RIEHLÉ "UNIVERSITY" WEIGHING BEAM FOR TESTING MACHINES.  
WITH VERNIER POISE.



Patented August 16th, 1887.

Plate No. 262.

Telegraph.	
University.	Price, . . . . . \$

DESCRIPTION.

Our Vernier Poise consists of a traveling weight operated by a hand-wheel whose axis corresponds very nearly with the point of pivot, or *point of no vibration* of the beam. When the wheel is turned it does not therefore disturb the equilibrium of the beam. The hand-wheel shaft carries a small pulley which propels the poise by mean of a cord. There is a tightener and pulley at the other end for adjustment. The beam is graduated in 100 lb. marks and the poise arranged as a Vernier to read to 10 lbs, in the usual way.

OPERATION AND ADVANTAGES.

This beam arrangement was designed to enable the operator to weigh continuously and easily while using the force pump at the same time. It makes it possible and convenient for a single person to conduct a test and keep the beam and the pressure in equilibrium, and avoids the necessity of manipulating the main and jockey poises at every 1,000 pounds of pressure. It also furnishes a means of following rapid increments of pressure, otherwise difficult to secure.



## RIEHLÉ-PACIFIC AUTOMATIC FLAT CARD ATTACHMENT

FOR RECORDING ACTION OF MATERIALS DURING PROCESS OF TESTING ON TESTING MACHINES.

(THIS ATTACHMENT CAN BE USED IN CONNECTION WITH ANY OF THE LARGER SIZE TESTING MACHINES.)

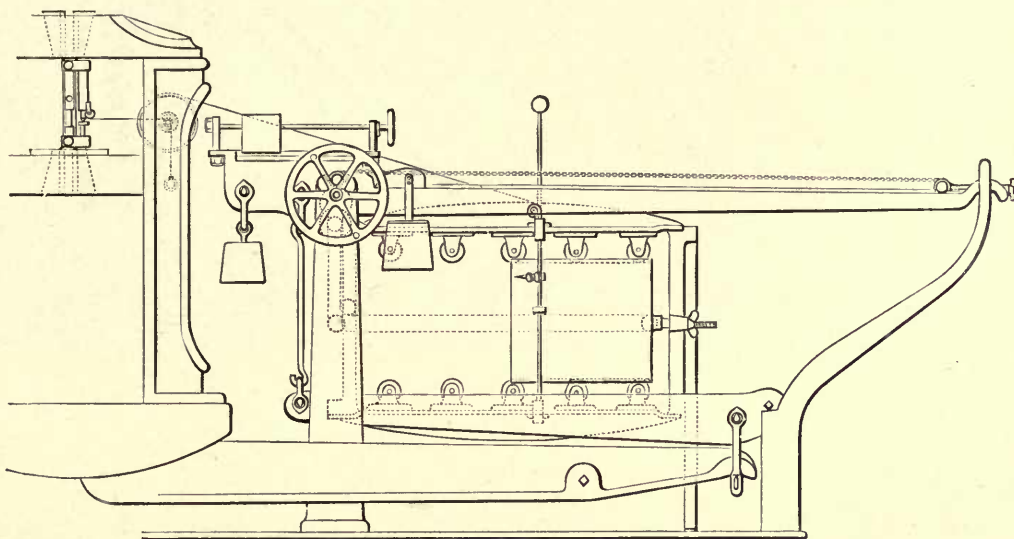


Plate No. 221.

*Telegraph.*

Pacific. Price, . . . . . \$



### DESCRIPTION AND OPERATION.

This style of card was designed with a view to supplying those test engineers who are averse to using a cylinder or drum, and who prefer a flat card, where all of the diagram is exposed at once.

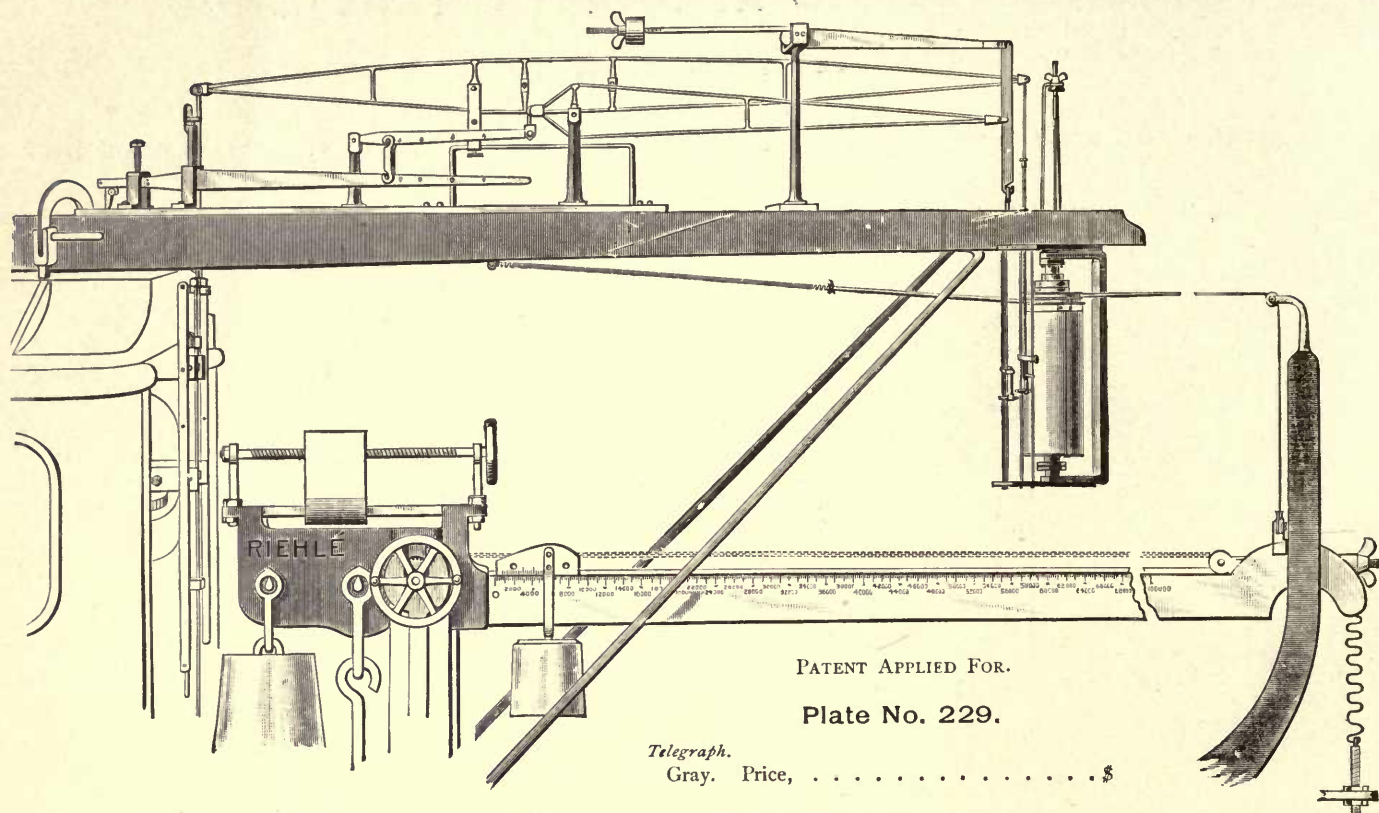
It consists of a plate of sheet brass mounted on rollers, so as to travel easily, and actuated in a forward and backward movement by an endless chain, with a tightening device, and driven from the same gear as those operated by the hand-wheel in propelling the poise. By altering the ratio of these gears, it will be seen that the proportion between the relative travel of the poise and card plate can be adjusted. To secure the vertical movement corresponding in this case to the amount of stretch, an extensometer has been arranged with telescopic slides which hold the instrument in line during extension of the specimen. There are two of these slides, one on each side of specimen, and corresponding to the pointed adjusting screws. A third joint is arranged with a loose sliding plunger capable of following up the stretch of the specimen, and communicating its movement to a fine wire, which leads to a small drum, around which it is wrapped once or twice, and tension applied by means of a small weight. The drum can be made in steps so that another wire may lead off from a size five or ten times the size of the smaller, thus magnifying the stretch proportionally.

The wire then leads over a guide pulley to the pencil bar, which descends in a vertical line as the yielding of the specimen allows the plunger to fall. There is a screw adjustment to bring the plunger and its pencil to zero, and the combination of the two movements as described forms a diagram curve on the paper sheet secured to the brass plate in the usual manner.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-GRAY AUTOMATIC WEIGHING AND RECORDING ATTACHMENT.



PATENT APPLIED FOR.

Plate No. 229.

Telegraph.

Gray. Price, . . . . . \$

### DESCRIPTION AND OPERATION.

This instrument is intended for making a complete automatic strain diagram, and has the peculiar feature of giving two curves—one of the full test; the other of the test within the elastic limit, and very much enlarged. As shown in the construction, the clamping device multiplies the stretch of the piece twice by the time it comes to the connecting rod, and at the same time eliminates any error from the stretch of the test bar between the clamps and where it is fastened in the heads. These clamps are of a new and improved pattern, and are adjustable to tension pieces of any length and thickness, or to compression test pieces, and are provided, at the attachment to the piece, with a device for following up any diminution in the dimensions of the test piece caused by the stress.

The first end of the upper clamp-bar hangs in a stirrup from the head of the machine, thus forming a fixed point; and the lower clamp is fixed at its final end to the connecting rod by pendant piece of the same length as the connection between the upper and lower clamp, thus securing arcs of the same radius. The connecting rod is surmounted by a post with an adjusting screw in its top, so that the bearings of this post can be brought up under the knife edges of the first lever of the sensitive system helping to counter-poise this set by the thrust from beneath. By means of the removable link, and by having pivots at different points in the first two levers of this system, the curve within the elastic limit can be taken at any one of the five multiplications from 100 to 500.

By means of the large lever the full curve of the test is plotted, and by using the three fulcrum points, as shown in the illustration, this curve gives the elongation at any one of three multiplications. By this means, we adapt our curve to the nature of material under strain.

By means of the adjustment at the top of the connecting rod, we can make use of the high multiplications by bringing the pencil back to the zero line each time it approaches the top of the card, thus enabling us to extend the diagram any length without passing off the card. The vertical travel of the pencil represents deformation in the test piece, while the rotation of the drum means weight. By the use of the spring on the end of the beam the machine can be adjusted to different degrees of sensitiveness—that is, giving the spring one-tenth the tension, the sensitiveness of the card increases ten times.

By the use of the poise a convenient method of proving the accuracy is always available, so that the machine can be quickly set to give the greatest scope in the test curve. The method of proving the spring is to use a piece of steel whose elastic limit exceeds the load applied to it, and this load is accurately weighed by means of the poise. The poise is then moved back to zero, and the spring attached, and the revolution of the drum accurately noted.

Standard profile paper is used on the drum, and the tapes put on the proper cone of the drum so that the weight can be accurately determined at any point of the test.



## NONPAREIL AUTOMATIC CARD ATTACHMENT FOR TESTING MACHINE.

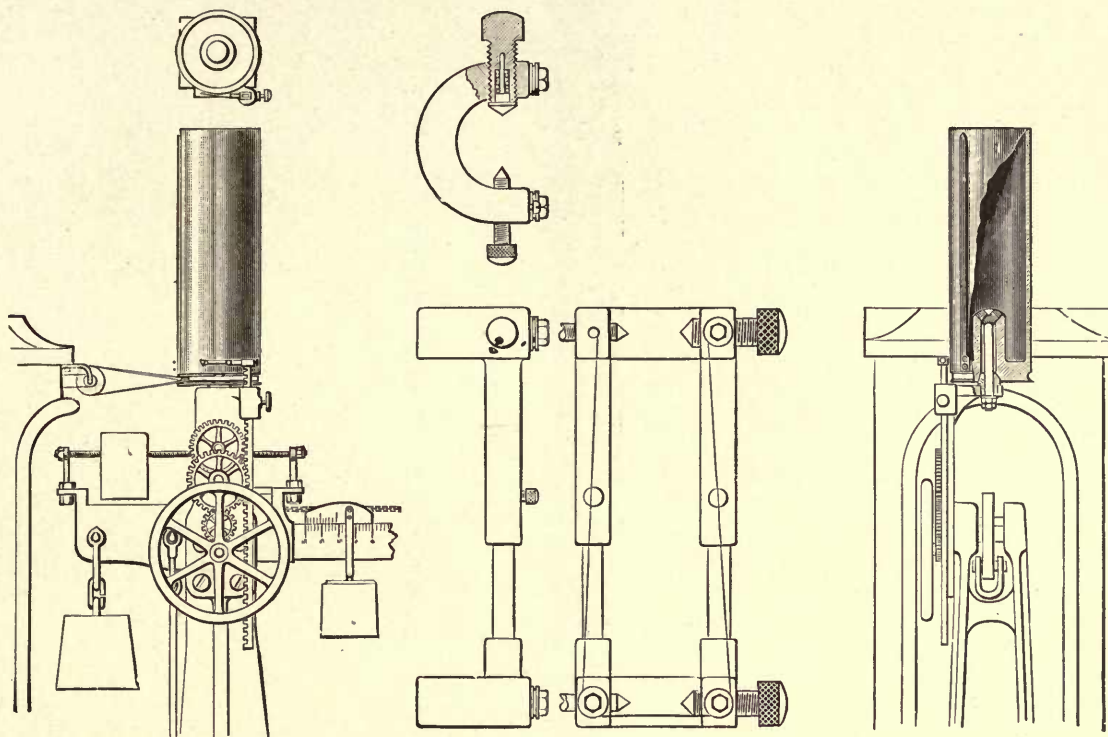


Plate No. 230.

*Telegraph.*  
Nonpareil. Price, . . . . . \$

### DESCRIPTION AND OPERATION.

This is a very simple apparatus for making a diagram of the test curve, and consists of a cylinder mounted on a bracket and capable of being revolved easily by a tape or wire attached to the pulley which is a part of the bottom of this cylinder. The wire connects with a telescopic Extensometer which is fastened to the specimen by convenient screws, one of which, in each pair, has a spring to follow up reduction of area in specimen. The elongation of the specimen takes up the connecting wire at each side, thus doubling the actual stretch, and any further multiplication can be given by means of an intermediate drum with different sizes of steps for the purpose. This elongation of the specimen causes the drum to revolve on its axis, while the vertical ordinates, of pressure, are obtained by means of a rack and gears operated from the hand-wheel, which causes the poise to travel, and any convenient reduction of this travel can be made to suit the nature of the specimen or pleasure of the observer.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-PAINE EXTENSOMETER.

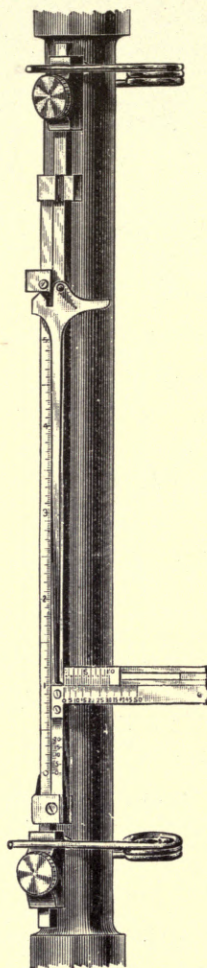


Plate No. 168.

*Telegraph.*

Paine. Price, . . . . . \$

### DESCRIPTION.

This instrument was invented by Colonel W. H. Paine, for use on the Brooklyn Bridge. It can be made to read from thousandths up to ten-thousandths of an inch (and finer if necessary) by means of a vernier.

The ordinary form reads to one-thousandth of an inch, on right-angle arm, and to ten-thousandths of an inch by a vernier.

It is wholly mechanical in operation and is for either tension or compression.

This instrument operates on the bell-crank lever principle, and magnifies the stretch in proportion to the arms of lever employed. It is very light and is generally held to the specimen by the pressure of a coiled spring fork. It is secured in this way to the centre-punch marks in the specimen, and the slides adjusted to zero, then any extension moves the long arm of the lever and pushes the little scale along the stationary one and reading by a vernier gives quite accurate and fine measurements.

Arrangements have been made with the Executor of the estate of W. H. Paine, whereby the "Paine Extensometer" can be only made by the Riehlé Bros. Testing Machine Co.

NOTICE.—This is the instrument that saved the Niagara Suspension Bridge from being condemned. When attached to any large cables it was found to be so delicate that every car, as it was run on, indicated its weight by the stretch of the instrument in loads as small as one ton.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-YALE EXTENSOMETER.

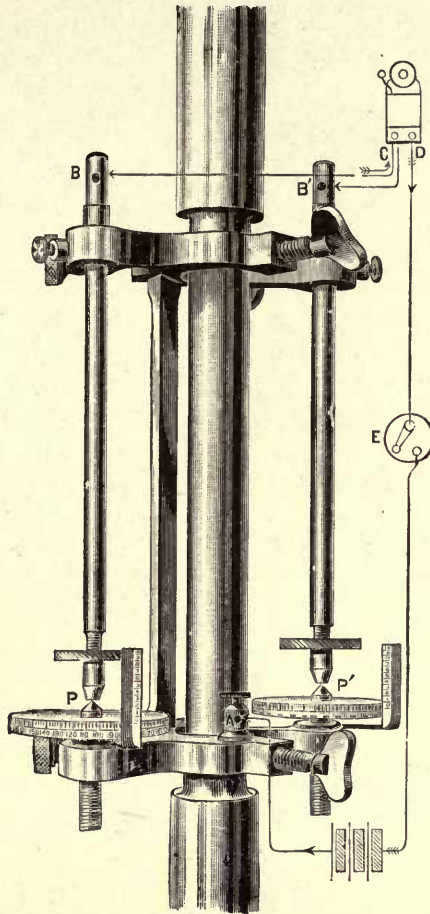


Plate No. 179.

Telegraph.

Yale. Price, . . . . . \$

### DESCRIPTION.

This Extensometer is a simplification of the Marshall apparatus, embodying its best points, yet with some improvements to increase ease and accuracy of adjustment; notably, by introduction of the squaring gauge bar, which keeps the clamps parallel, brings the points of measurement opposite, and gauges the length.

It reads to ten thousandths, by micrometer screw, giving readings on each side of specimen for an average. It has special clamps on top for tightening different lengths of measuring-bar, and just below an adjusting wheel for bringing screw to zero.

An electric battery and bell can be attached, if desired, for making contact.

The squaring gauge bars are made in different lengths, as ordered, the one illustrated above shows a bar measuring eight inches between points.

NOTE.—Do not neglect to remove the gauge-bar before beginning to strain the specimen.

### IN USE BY

YALE UNIVERSITY (SHEFFIELD SCIENTIFIC SCHOOL OF), . . . . . New Haven, Conn.  
GREAT NORTHERN RAILWAY, . . . . . St. Paul, Minn.  
ARKANSAS INDUSTRIAL UNIVERSITY, . . . . . Fayetteville, Ark.  
UNIVERSITY OF CALIFORNIA, . . . . . Berkley, Cal.

MAGILL UNIVERSITY, . . . . . Montreal, Can.  
OVERMAN WHEEL CO., . . . . . Chicopee Falls, Conn.  
CAMBRIA IRON CO., . . . . . Johnstown, Pa.  
UNIVERSITY OF SIDNEY, . . . . . New South Wales, Australia.

AND OTHERS.

“EXTRACT OF LETTER.”

CAMBRIA IRON CO., JOHNSTOWN, PA.

“The Riehle-Yale Extensometer is a fine instrument, and one that I would cheerfully recommend.”

Yours truly,

(Signed) JAS. B. KRESS, Eng. of Tests.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-BUZZBY HAIR-LINE EXTENSOMETER.

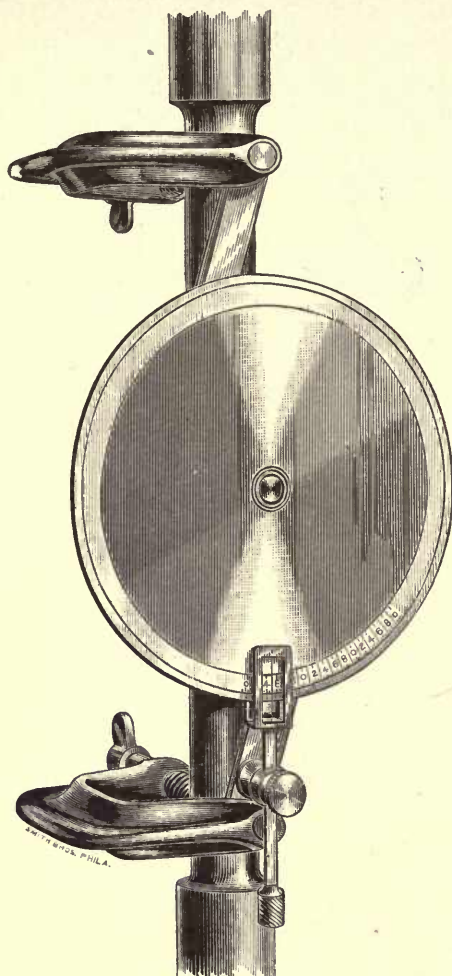


Plate No. 169.

*Telegraph.*  
Buzby. Price, . . . . . \$

### DESCRIPTION.

This instrument reads to thousandths of an inch, or closer if desired, and is readily applicable to specimens of different lengths.

The two clamps being attached only to the specimen, the instrument can be used on any Testing Machine, and it is wholly mechanical in operation.

It consists of the two clamps, to each of which is attached a steel bar. These bars pass each other, having between them a roller and the whole being incased in a sleeve with tension attachment, so that the slightest motion of the clamps relatively to each other produces a revolving motion of the roller.

To the outer end of the roller is attached the disc, as shown in photograph, so that the motion of the roller is largely multiplied on the rim of the disc, which is graduated. In front of the rim will be observed the upper end of the arm carrying a cross-hair in front, and a mirror behind the disc. By this simple method a very accurate reading is obtained by bringing the three points in a line.

The cross-hair arm has an adjusting screw for bringing the cross-hair and mirror to proper position longitudinally to catch the reflection and take the reading.

To operate this instrument it is only necessary to clamp it to the specimen, and adjusting the mirror and cross-hair, revolve the disc by hand until the zero line corresponds with the cross-hair and its reflection. Strain is then applied to the specimen and readings taken as desired in the same manner as described. For the fine reading a magnifying glass can be used with added comfort, which will enable the operator to read to half a thousandth.

If desired this instrument can be made as a double reader, and a mean of both sides taken.

It is very simple and handy, and though not generally graduated finer than .001, it can be, while it has a much greater range of stretch than many others.

### IN USE BY

STATE SCHOOL OF MINES, . . . . . Golden, Col.  
UNIVERSITY OF CALIFORNIA, . . . . . Berkley, Alameda Co., Cal.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ EXTENSOMETER.

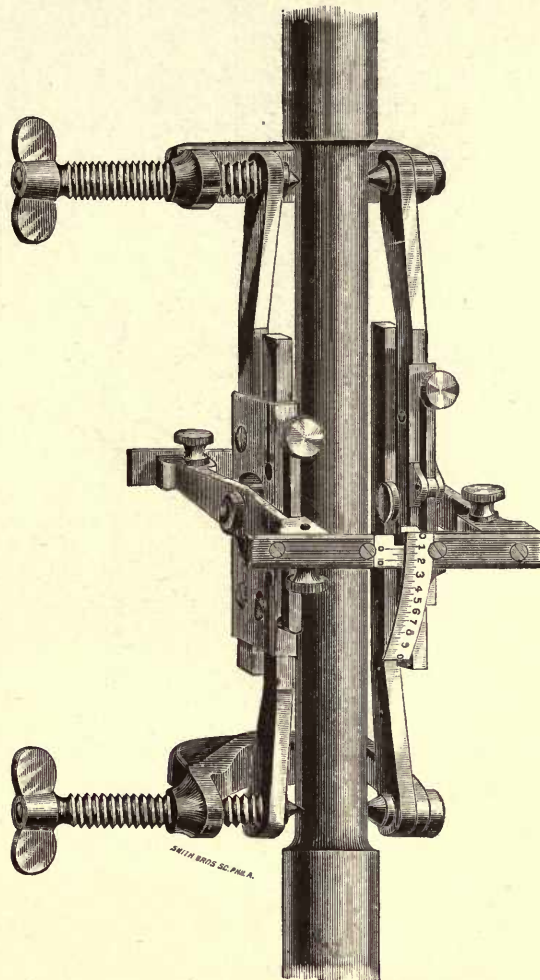


Plate No. 172.

*Telegraph.*

RIEHLÉ. Price, . . . . . \$

This instrument reads the elongation of metal under stress to thousandths or to ten-thousandths of an inch.

It is wholly mechanical in operation, so that no battery is necessary, and can be used on any Testing Machine. It is adjustable to specimens of six and eight inches in length, and is made in a modified form for two-inch specimens.

It is made in a cheap form to read on one side, indicating the total stretch; or in the regular double reading form the sum of the two sides gives a mean reading equivalent to the total stretch. It is adjusted to the specimen by the clamp screws in the usual manner, and the ends of the graduations are then brought together at zero at both sides at the same time. Pressure is then applied to the specimen, and the readings taken in the same manner as any scale and vernier, the scale being graduated to thousandths and by the vernier to ten-thousandths.

### IN USE AT

NAVAL ACADEMY, . . . . . Annapolis, Md.  
UNITED STATES NAVY YARD, . . . . . Brooklyn, N. Y.  
WORCESTER POLYTECHNIC INSTITUTE, . . . . . Worcester, Mass.

WESTERN UNIVERSITY, . . . . . Allegheny City, Pa.  
BURDEN IRON WORKS, . . . . . New York, N. Y.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-MARSHALL EXTENSOMETER.

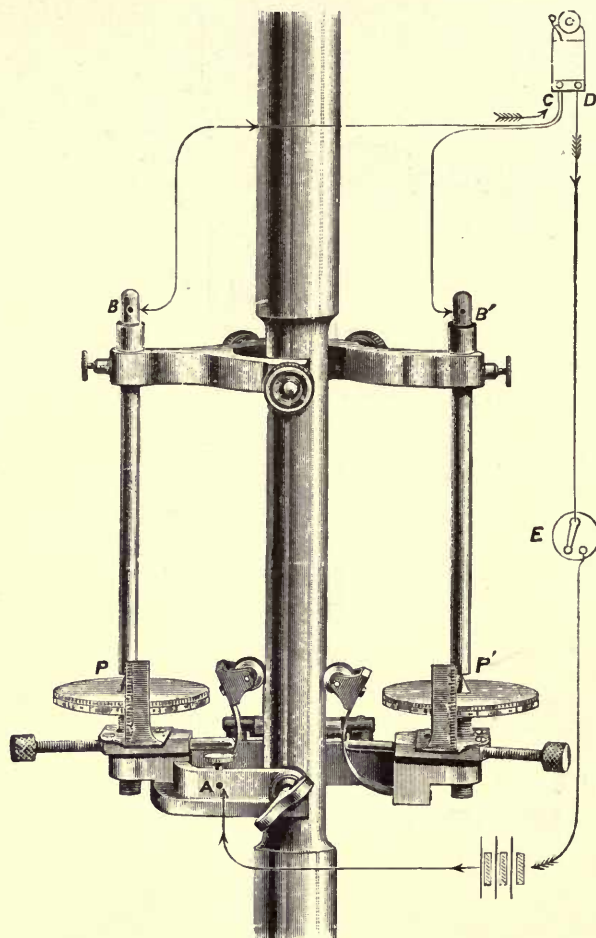


Plate No. 170.

Telegraph.

Marshall. Price, . . . . . \$

This instrument is the invention of the late Mr. C. A. Marshall, M. E., of the Cambria Iron Company.

*Riehlé Bros. Testing Machine Co. have secured from the Estate of the late C. A. Marshall the exclusive right to make and sell these Extensometers.*

It consists of an upper clamp in which are two insulated bars which are capable of adjustment for specimens from two inches to eight inches in length. These bars are connected by wires to a circuit in which a bell and battery are placed; the lower clamp, in addition to the set screw which holds it to the specimen, has a spring and roller attachment, which, in connection with a spirit level, assists in the accuracy of the reading.

The two micrometer screws have a vertical fleet of one inch; the readings on the rim of the disc indicate ten-thousandths. In operation a certain increment of load is added, the reading taken first on one and then on the other micrometer screw by running them up until the contact of the point of the screw with the insulated bar causes the bell to ring. Another increment is then added and the readings taken again, and so on until the elastic limit is reached, the average of the readings at each increment giving the actual stretch on the axial line.

### IN USE BY

THOMSON-HOUSTON ELECTRIC COMPANY, . . . . . Lynn, Mass.  
PENNSYLVANIA STATE COLLEGE, . . . . . Centre Co., Pa.

### OPERATION.

For connecting up the Extensometer, please follow lines of diagram:

From one terminal of Battery to lower clamp at A, from B and B' to Binding post C on the Electric Bell, from the other Binding post marked D, to switch E, and from there back to the other terminal of Battery.

Screw up Micrometer Screws at P and P' until each of them is making connection and bell rings, then mark the readings on both sides.



## RIEHLÉ-BOSTON MICROMETER GAUGE EXTENSOMETER.

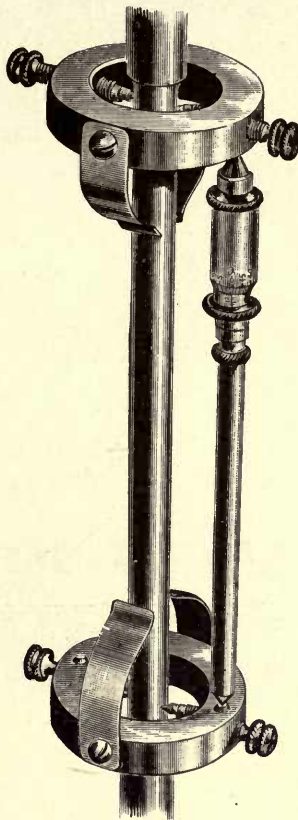


Plate No. 28.

*Telegraph.*

Boston. Price, . . . . . \$

The illustration represents our gauge for measuring minute extensions of specimens, within the limit of elasticity. It consists, as shown, of the graduated micrometer screw, reading in thousandths up to one inch, and having pointed extension pieces attached, for gauging the distance between the small projections on the collars, fastened to the specimen at the proper distance. These collars are partly self-adjusting by the springs which help to centralize them. They are then clamped in place by means of the pointed set screws on the sides, and measurements are made between the projections on opposite sides of the specimen, and compared to denote any changes in shape or variations in the two sides. These gauges can be made six, eight, or ten inches in length, or can be provided with interchangeable points to suit all three.

There are other appliances of improved and more recent designs shown in this catalogue for attaining the same results, but should the above illustrated Extensometer meet the wants of any of our customers it can be furnished.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-JACOBI MERCURY COLUMN EXTENSOMETER.

### DESCRIPTION.

The principle of this apparatus is the difference in volume of the two cylinders, by which a very minute movement of the large plunger is multiplied many times in the thermometer tube. Elongations of specimens are read to ten-thousandths of an inch by the graduation. By arranging the large plunger and cylinder so they can be attached to a specimen, and with screw adjustments for regulating the height of columns to zero, this becomes a very sensitive measuring apparatus.

*Telegraph.*

JACOBI. Price, . . . . . \$

### IN USE AT

U. S. NAVAL ACADEMY, . . . . . Annapolis, Md.

## RIEHLÉ LAYING-OFF GAUGE.



Plate No. 30.

*Telegraph.*

MARTIN. Price, . . . . . \$

A steel gauge, with parallel-sided slots, with corresponding sides exactly one inch apart. Used for laying off specimens to observe the elongation in different parts of flat or square test-pieces. On the under side is a shoulder bracket for keeping the slots at right angles with the edge of the test-piece while marking. In using, place the shoulder against the edge of the test-piece, hold it firmly in place with the left hand, and with a sharp-pointed piece of steel scratch a line across the piece, being careful to use corresponding sides of the slots. This will give lines exactly one inch apart and at right angles to the centre line.

## RIEHLÉ DOUBLE-POINTED CENTRE PUNCH.

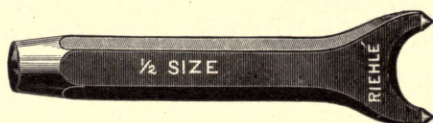


Plate No. 31.

*Telegraph.*

ANNAPOLIS. Price, . . . . . \$

A steel double-pointed punch, with points exactly one inch apart. Used for round, flat, or square test-pieces, by drawing a centre line and pricking off the inches on this line, thus giving an opportunity of observing the elongation in different parts of the test-piece.

An indispensable adjunct to every testing machine.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

FOR EXAMPLE.

	At P.	At P'.	Adding P to P'.	Average difference in stretch per load in 0.0001".
Readings at Starting Point, . . . .	0.009	0.018	0.027	
After applying first load, . . . .	0.012	0.023	0.035	0.004
After applying second load, . . . .	0.0155	0.0265	0.042	0.0035

This result we obtain if we deduct from P plus P' second reading.  
Total P plus P' first reading.

And divide difference by 2

After taking readings, release strain, and see if test specimen will come back to starting point ; continue this until readings differ from first reading, at which point the Elastic Limit is reached, after that the instrument should be detached if tensile strain of specimen is desired, as in breaking it may injure the instrument.

For those who object to relieving the pressure, equal amounts of load can be added near the Elastic Limit and the readings taken. When there is a marked difference in the stretch for the same added load, say one hundred or two hundred pounds, the Elastic Limit has been reached.

THE MICROMETER SCREW ATTACHMENT FOR  
RIEHLÉ-MARSHALL EXTENSOMETERS.

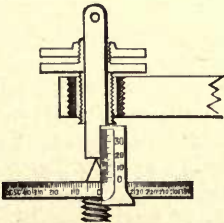


Plate No. 171.

Telegraph.  
Franklin. Price, extra, . . . . . \$



The Micrometer screw for adjusting slide connecting-rods on the Marshall Extensometer will enable the user to start with 0 on the division for each observation, which is almost an impossibility, with the Clamp Screw adjustment, especially when the Batteries are beginning to run down.

In order to avoid this, the sketch will explain the method of overcoming this point.  
1st. The shaded Rubber Bushing in clamp will serve for insulation ; into this is fastened a brass nut with a closely fitting screw of a fine thread, and giving about 1/4 inch motion.

On top of this screw above the knurled-head is a taper screw slotted, and by fastening the knurled-head nut, will clamp the rod to adjusting screw.

2d. Commence with 0 on the scales and bring down the rod, by turning the screw until it is making connection.  
The above will make a convenient and quick adjustment, beside having the advantage of having the readings from 0 up to the desired limit without deducting the first reading at the beginning.



## RIEHLE-SCOTT VERNIER FOR NOTING MOVEMENT OF TOOL HOLDERS.

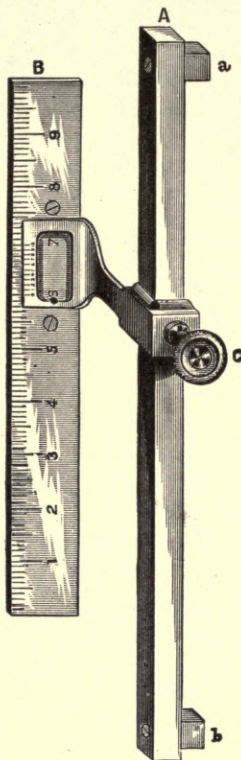


Plate No. 29.

Telegraph.

Scott. Price, . . . . . \$

This illustration represents a Vernier attachment for measuring elongations of specimens. It consists of a bar of three-eighths square metal, properly secured to the column casting, and upon it slides an adjustable vernier which can be set to any point. A scale is attached to the cross-head of machine in such a manner as to read properly with the vernier. When a specimen is set and the wedges have secured a solid grip, the vernier is adjusted and the reading taken. Subsequent readings can be had at any required pressure, thus securing the elongations corresponding to those points.

This apparatus was designed by Mr. Irving M. Scott, of Union Iron Works, San Francisco, Cal., and is in use at that place: it indicates the movement of the cross-head holding the wedge grips that secure the specimen in place. As noted above, the elongation of the specimen should only be recorded after the specimen is firmly gripped by the wedges, and after all slipping of the tools or specimen has taken place.

The scale *B* is secured to the movable cross-head of testing machine by screws (shown in drawing). *A* is a bar of iron fastened to the frame of testing machine by screws at *a* and *b*. The vernier is adjusted on the scale *B*, and secured by clamp and screw *C* to bar *A*.

### IN USE AT

UNION IRON WORKS, . . . . . San Francisco, Cal.  
JOHNSON CO., . . . . . Johnstown, Pa.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-SLOANE MICROMETER CALIPER.

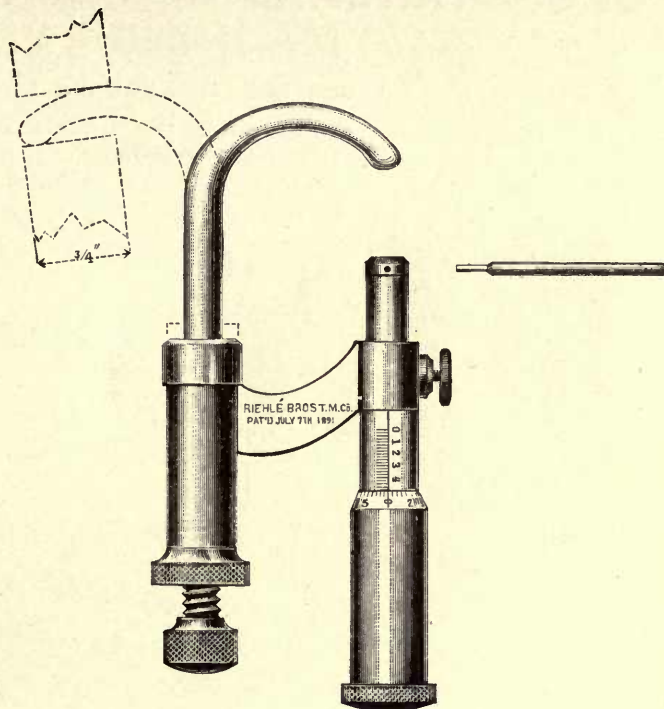


Plate No. 207.

PATENTED JULY 7TH, 1891. OTHER PATENTS PENDING.

Telegraph.

Sloane. Price, . . . . . \$

The above represents a new Micrometer Caliper. It has one leg movable to enable it to be inserted in small holes in plates, boilers, etc., and designed to measure the thickness of material up to 1 inch at any place selected.

While originally designed for the Steam-Boiler Inspection service, it has been found useful in many unlooked-for directions, as it can be used as an ordinary Micrometer Caliper, as well as when the movable leg is available.

The measuring leg is graduated to one-thousandths of an inch, as in the ordinary Micrometer Caliper, but is also provided with a lock (shown in the knurled set screw in the cut) for fixing the measurement; a slight pressure is sufficient to secure it.

In operating through small apertures (a  $\frac{1}{4}$ -in. gas tap hole is large enough) release knurled nut two turns; then the movable leg is pressed downward until a pin fitting into a socket on it is disengaged, and allows it to be turned around on its axis. The movable leg is then hooked through the hole, and turned until the feather above mentioned slips into the slot, which brings the two caliper points into line, and is thrown up against its shoulder by a spring, after which the knurled nut is secured up tight again.

The graduated leg is then adjusted and locked, the movable leg pressed down and turned as before, and the Caliper removed.

When Calipering in dark places, the measurement being fixed, the Caliper can be taken out into the light and read, instead of being obliged to read it before removing.

The small hole necessary for inserting the Caliper in boiler shells, is closed by driving a copper rivet instead of tap and plug.

### Names and Addresses of Parties Using Riehle-Sloane Calipers.

#### PARAGRAPH 1.

##### UNITED STATES GOVERNMENT.

Yeager & Knapp, Local Inspectors, . . . . .	Dubuque, Ia., . . . . .	I	in.
Keller & Pratt, Local Inspectors, . . . . .	Albany, N. Y., . . . . .	I	"
C. Vert, Local Inspector, . . . . .	Philadelphia, Pa., . . . . .	I	"
Edw. W. Marion & Jos. G. Schumacher, Local Inspectors, . . . . .	Buffalo, N. Y., . . . . .	$I\frac{1}{2}$	"
Thos. H. Barrett, Local Inspector, . . . . .	New York City, N.Y., . . . . .	I	"
Andrew J. Savage, Local Inspector, . . . . .	Boston, Mass., . . . . .	I	"
Augustus Moore & Henry J. Devanny, Local Inspectors, . . . . .	Cincinnati, O., . . . . .	I	"

John G. Damron, Jr., Local Inspector, Gallipolis, O., . . . . .	I	in.
Jas. McGrath, Local Inspector, . . . . .	Cleveland, O., . . . . .	$I\frac{1}{2}$
Reuben M. Thomas, Local Inspector, . . . . .	Wheeling, W. Va., . . . . .	I
Daniel W. Chipman, and Wm. Fitzgerald, Local Inspectors, . . . . .	Milwaukee, Wis., . . . . .	I
Myron Scott, Local Inspector, . . . . .	Grand Haven, Mich., . . . . .	I
C. B. Fitzgerald, Local Inspector, . . . . .	Savannah, Ga., . . . . .	I

#### PARAGRAPH 2.

##### BOILER WORKS.

Daniel Shea & Co., Eagle Boiler Works, Memphis, Tenn., . . . . .	I	"
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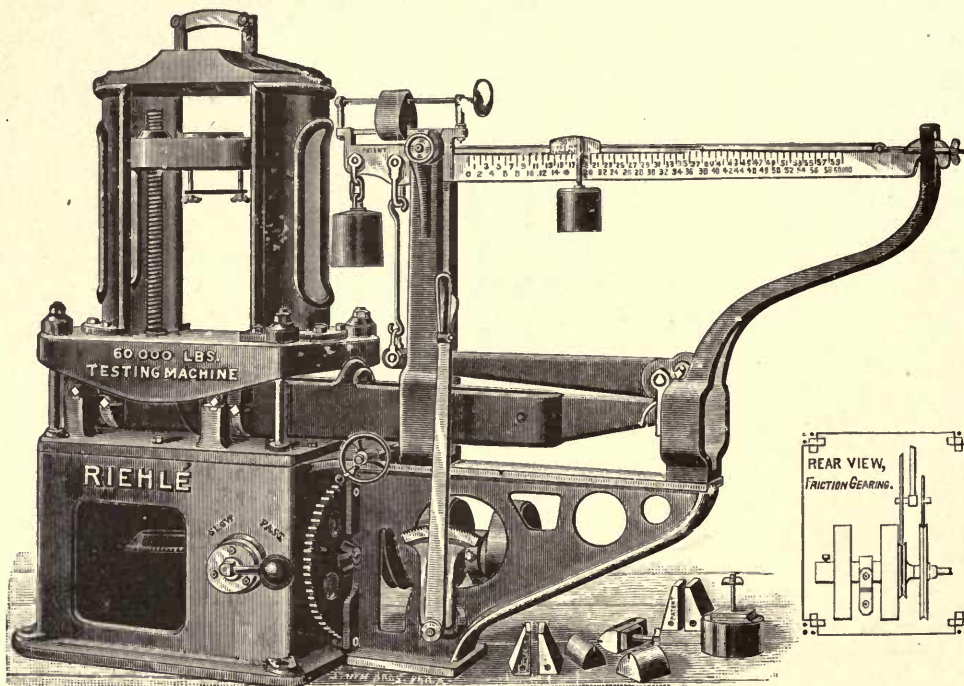


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

60,000 LBS. "HERCULES."

Furnished with "Riehlé Patented Wedge Grips," for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.  
Plate No. 37.

## DIMENSIONS.

Extreme Height, . . . . .	6 ft.
Extreme Length, . . . . .	8 ft.
Extreme Width, . . . . .	2 ft. 5 in.
Weight, . . . . .	3,400 lbs.
Shipping Weight, . . . . .	3,650 "
2 Pulleys, 12 in. x 2 1/4 in.	

## ADAPTATION.

Tensile Specimens 18 inches long or less, with 25 per cent. elongation for 18-inch specimens, or more for shorter ones.	
Round Specimens, . . . . .	1 3/8 in. diameter or less.
Square " . . . . .	1 1/4 in. square or less.
Flat " . . . . .	2 3/4 x 1 in. or less.
Transverse Specimens, . . . . .	20 in. or less to 6 in. long.

Compression Specimens, . . . . .	18 in. long or less.
Compression Surfaces, . . . . .	6 in. diam.
NOTE.—100,000 has 7 in. diameter, and all have about 2 in. to 2 1/4 in. steel centre.	

Motion of Pulling Head, . . . . . 1 ft. 11 in.  
Four different speeds with which a specimen can be stretched or broken, and two for driving in the opposite direction.

Speeds for 60,000 lbs. Screw-Power Testing Machine (80 Pulley Rev.) Maximum Speed for Setting and Light Tests, . . . . .		4 in. per min.
Quick Speed for Testing, . . . . .		1 in. in 1 min.
Minimum Speed for Testing, . . . . .		1 in. in 10 mins.
Intermediate Speed for Testing, . . . . .		1 in. in 3 1/2 mins.
Maximum Reverse Speed, . . . . .		4 in. per min.
Minimum Reverse Speed, . . . . .		1 in. in 3 1/2 mins.

These machines can be run faster if desired—up to, say, 120 revs.

*Telegraph.*  
Pennsylvania. Price, . . . . . \$

## DESCRIPTION AND OPERATION.

The engraving herewith shows one of the Riehlé latest improved Vertical Screw-Power Testing Machines, for testing materials by tensile, transverse, and compression strains. The parts are all designed with a view to strength, accuracy, and easy handling. The material is of the best, as is also the workmanship. The levers are adjusted to the standard of the United States Government.

There are four speeds for testing a specimen, and two for driving in opposite direction.

The power is applied by levers and friction pulleys for starting, stopping, and reversing; and for changing the speeds, a hand-wheel and tumbling-ball are used.

## IN USE BY

ARKANSAS INDUSTRIAL UNIVERSITY, . . . . . Fayetteville, Ark.  
BRAZILIAN GOVERNMENT, . . . . . Rio Janeiro, Brazil.  
AND OTHERS. (See folios 3, 4, 5, and 6.)

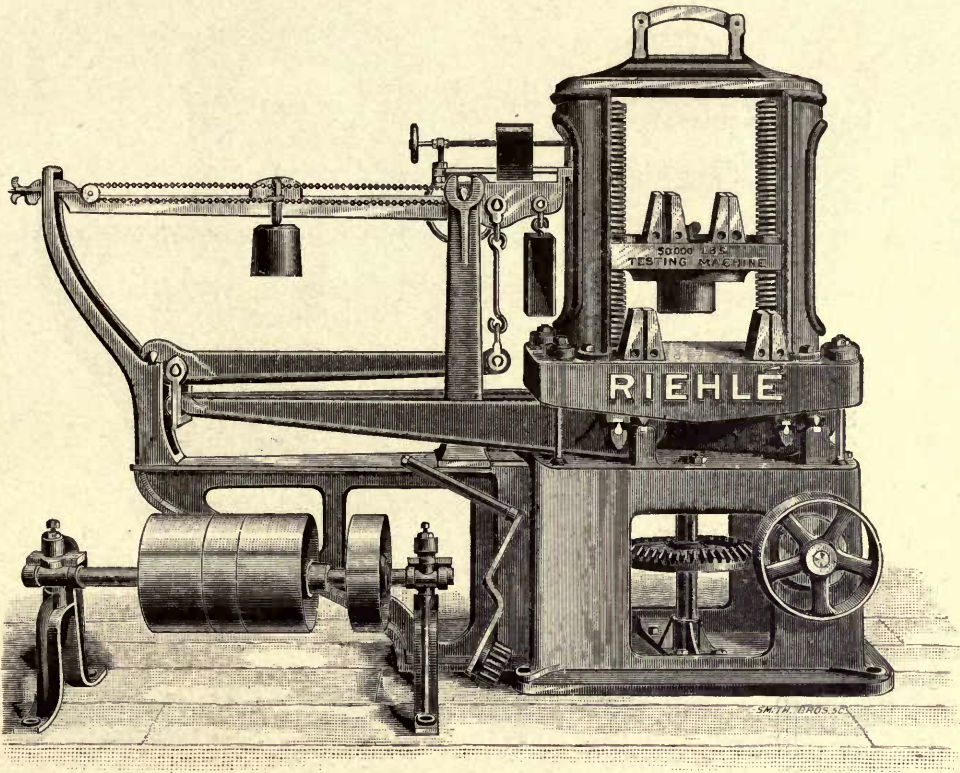


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

50,000 LBS. "VERMONT."

Furnished with "Riehlé Patented Wedge Grips," for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.

Plate No. 176.

DIMENSIONS.

Extreme Height, . . . . .	5 ft. 3 in.
Extreme Length, . . . . .	7 ft. 0 in.
Extreme Width, . . . . .	2 ft. 10 in.
Weight, . . . . .	2,251 lbs.
Shipping Weight, . . . . .	2,690 "

ADAPTATION.

Tensile Specimens 15 inches long or less, with 30 per cent. elongation for 15-inch specimens, or more for shorter ones.	
Round Specimens, . . . . .	1 1/4 in. diameter or less.
Square " . . . . .	1 in. square or less.
Flat " . . . . .	2 1/2 x 3/4 ins. or less.
Transverse Specimens, . . . . .	15 in. or less to 6 in. long.
Compression " . . . . .	10 in. long or less.
Compression Surfaces, . . . . .	5 in. diam. with 2 in. steel centres.
Motion of Pulling Head, . . . . .	1 ft. 8 in.

Telegraph. Vermont. CAPACITY, 50,000 lbs. Price, . . . . . \$  
Indicator. Indicator for Elastic Limit, extra, net. Price, . . . . . \$

Three different speeds with which a specimen can be stretched or broken, and also for driving in the opposite direction.  
This machine can be arranged with pulley for belt, if ordered.

IN USE BY

UNIVERSITY OF VERMONT, . . . . . Burlington, Vt.  
STATE AGRICULTURAL COLLEGE, . . . . . Ft. Collins, Col.  
AND OTHERS (see folios 3, 4, 5, and 6).

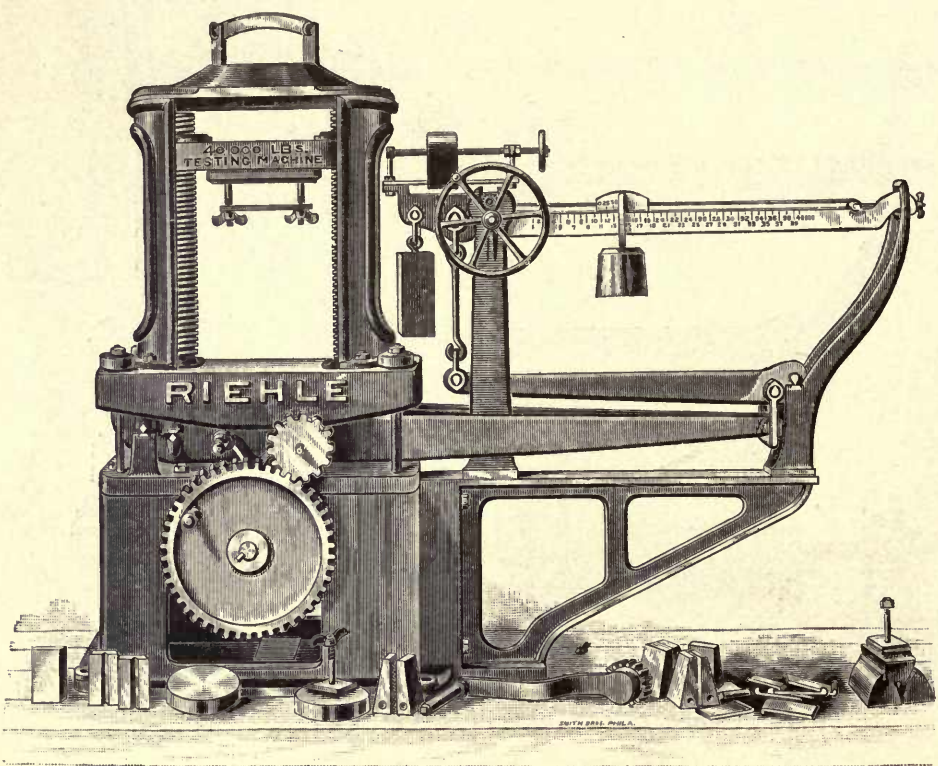


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

40,000 LBS. "KEYSTONE."

Furnished with Riehlé Patented Wedge Grips, for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Patented Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.

Plate No, 164.

DIMENSIONS.

Extreme Height, . . . . .	5 ft.
Extreme Length, . . . . .	6 ft. 6 in.
Extreme Width, . . . . .	3 ft.
Weight, . . . . .	1,900 lbs.
Shipping Weight, . . . . .	2,292 lbs.

ADAPTATION.

Tensile Specimens 15 in. long or less, with 30 per cent. elongation for 15 in. specimens, or more for shorter ones.	
Round Specimens, . . . . .	1 in. diameter or less.
Square " . . . . .	7/8 in. square or less.
Flat " . . . . .	2 1/2 x 1 1/2 ins. or less.
Transverse " . . . . .	18 in. or less to 6 in. long.
Compression Specimens, . . . . .	10 in. long or less.
Compression Surfaces, . . . . .	6 in. diameter with 2 in. steel centres.
Motion of Pulling Head, . . . . .	1 ft. 8 in.

Telegraph.	
Keystone. Price, . . . . .	\$
Indicator. Indicator for Elastic Limit, extra, net. Price, . . . . .	\$

Three different speeds with which a specimen can be stretched or broken, and also for driving in the opposite direction.

This machine can be arranged with pulley for belt, if desired, but is generally operated by hand.

Furnished with an ordinary weighing beam, unless a beam with Riehlé's Patented Vernier Poise is ordered, and at an additional price.

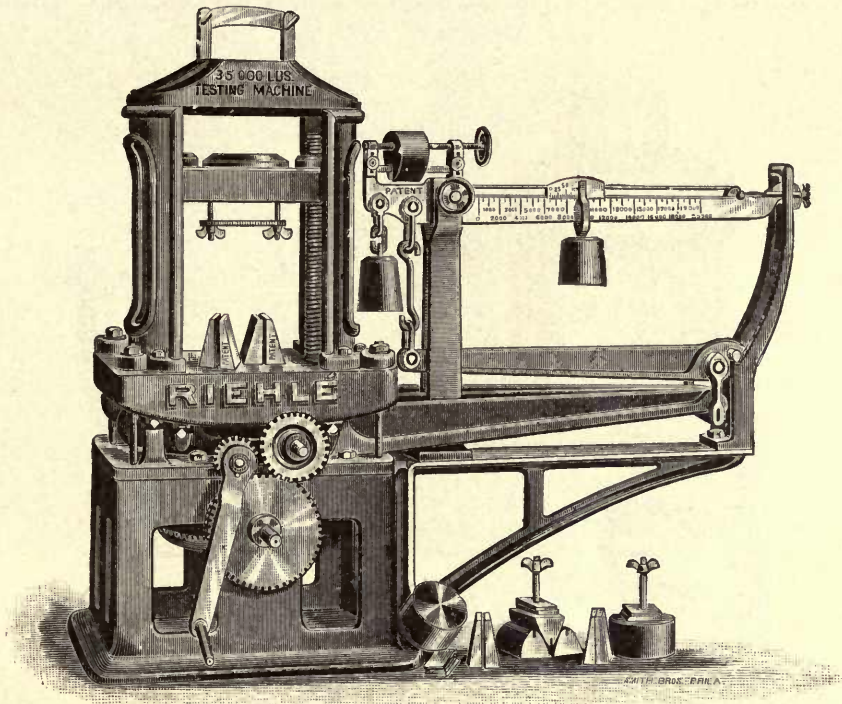


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

30,000 LBS. "AUBURN."

Furnished with "Riehlé Patented Wedge Grips" for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.

Plate No. 36.

## DIMENSIONS.

Extreme Height, . . . . .	4 ft. 6 in.
Extreme Length, . . . . .	5 ft. 6 in.
Extreme Width, . . . . .	1 ft. 9 in.
Weight, . . . . .	1,600 lbs.
Shipping Weight, . . . . .	1,850 lbs.

## ADAPTATION.

Tensile Specimens 1 ft. long or less, with 30 per cent. elongation for 12 in. specimens, or more for shorter ones.	
Round Specimens, . . . . .	$\frac{3}{4}$ in. diameter or less.
Square " . . . . .	$\frac{3}{4}$ in. square or less.
Flat " . . . . .	$2\frac{1}{4}$ in. by $\frac{1}{2}$ in. or less.
Transverse " . . . . .	15 in. or less to 6 in. long.
Compression " . . . . .	10 in. long or less.
Compression Surfaces, . . . . .	5 in. diameter with 2 in. steel centres.
Motion of Pulling Head, . . . . .	1 ft. 5 in.

Three different speeds with which a specimen can be stretched or broken, and also for driving in the opposite direction.

This machine can be arranged with pulley for belt if desired, but is generally operated by hand.

Furnished with an ordinary weighing beam, unless a beam with the Riehlé patented vernier poise is ordered, and at an additional price.

Telegraph.

Auburn, Price, . . . . .	\$
Indicator. Indicator for Elastic Limit, extra, net, Price, . . . . .	\$

## DESCRIPTION.

This illustration represents one of the Riehlé new and improved Screw-Power Testing Machines for ascertaining the strength of metals and other materials under tensile, transverse, or compression strains, combining the elements of accuracy, speed, and facility of handling. The machine is constructed of the best materials, and the levers adjusted to the standard weights of the United States Government. There are three different speeds for testing a specimen and also for driving in the opposite direction.

## IN USE BY

DENNIS LONG & CO., . . . . . Louisville, Ky.  
J. B. & J. M. CORNELL, . . . . . New York, N. Y.  
AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS, College Station, Texas.

ALABAMA POLYTECHNIC INSTITUTE, . . . . . Auburn, Ala.  
HERRESHOFF MANUFACTURING CO., . . . . . Bristol, R. I.  
AND OTHERS. (See folios 3, 4, 5, and 6.)

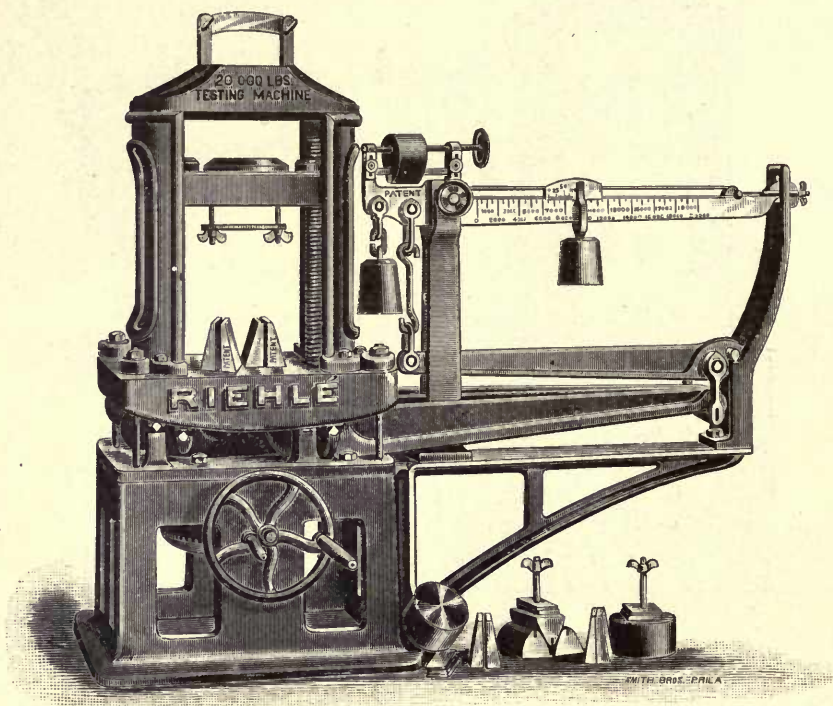


RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SCREW-POWER TESTING MACHINE.

20,000 LBS. "OXFORD."

Furnished with "Riehlé Patented Wedged Grips," for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Vernier Poise (Pat. Aug. 16th, 1887).



Patented July 2d, 1889.

Plate No. 153.

## DIMENSIONS.

Extreme Height, . . . . .	4 ft. 6 in.
Extreme Length, . . . . .	5 ft. 6 in.
Extreme Width, . . . . .	1 ft. 9 in.
Weight, . . . . .	1,400 lbs.
Shipping Weight, . . . . .	1,650 lbs.

## ADAPTATION.

Tensile Specimens, 1 ft. long or less, with 30 per cent. elongation for 1 ft specimens, or more for shorter ones.	
Round Specimens, . . . . .	$\frac{5}{8}$ in. diameter or less.
Square " . . . . .	$\frac{5}{8}$ in. square or less.
Flat " . . . . .	2 in. x $\frac{1}{2}$ in. or less.
Transverse " . . . . .	15 in. or less to 6 in. long.
Compression Specimens, . . . . .	10 in. long or less.
Compression Surfaces, . . . . .	5 in. diameter with 2 in. steel centres.
Motion of Pulling Head, . . . . .	1 ft. 5 in.

Telegraph.

Oxford.	Price, . . . . .	\$
Indicator.	Indicator for Elastic Limit, extra, net. Price, . . . . .	\$

This machine can be arranged with pulley for belt, if desired, but is generally operated by hand.

Furnished with an ordinary weighing beam, unless a beam with Riehlé patented vernier poise is ordered, and at an additional price.

A pulley for belt can be attached to the machine, also change-speed countershaft at a reasonable figure, but the machine is too small to require this, although some parties have it in use.

## IN USE BY

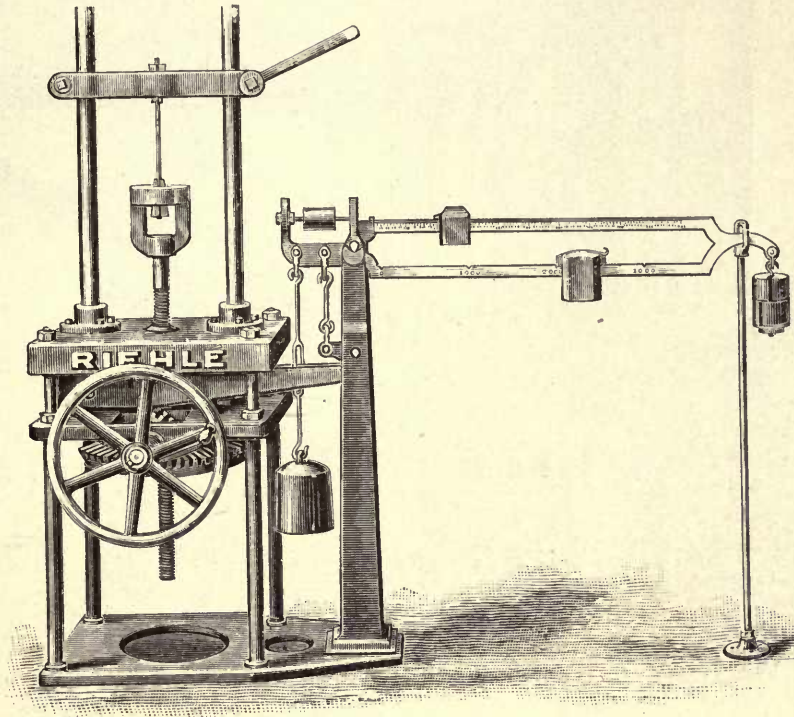
U. S. NAVAL ACADEMY, . . . . . Annapolis, Md.  
PORTAGE IRON CO., . . . . . Duncansville, Pa.

TAMARACK-OSCEOLA COPPER CO., . . . . . Dollar Bay, Mich.  
AND OTHERS (see folios 3, 4, 5, and 6).



# RIEHLÉ U. S. STANDARD PATENTED SCREW-POWER TESTING MACHINE.

10,000 LBS. "WALDO."



Patented July 2d, 1889.

Plate No. 218.

## DIMENSIONS.

Extreme Height, . . . . .	8 ft.
Extreme Length, . . . . .	6½ ft.
Extreme Width, . . . . .	2½ ft.
Weight, . . . . .	1,100 lbs.
Shipping Weight, . . . . .	1,385 lbs.

## ADAPTATION.

Specimens 3 ft. long with 33 per cent. elongation.

Telegraph.	Price, . . . . .	\$
Waldo.	(Arranged for wire testing exclusively.)	Price, . . . . .
Stout.		\$

## DESCRIPTION AND OPERATION.

The arrangement and construction of this Machine is so simple as to require but little description. The great feature of the Machine is the ease and rapidity with which the top head can be shifted to suit different lengths of test wires. This is accomplished by simply releasing the clamping screws by a wrench and securing again in proper position. The power is readily applied by means of hand-wheel as shown, and the weighing is done on the double beam. The upper bar being marked as fine as 2 lbs., and the lower by 1,000 lb. notches.

## IN USE BY

WALDO & STOUT, . . . . . Bridgeport, Conn.

(For names and addresses of parties who use Riehlé U. S. Testing Machines, please see folios 3, 4, 5, and 6.)

The first RIEHLÉ TESTING MACHINE was made in the year 1867. Since this date we have made nearly 500 machines, which have been sent to all parts of the globe.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD VERTICAL HYDRAULIC TESTING MACHINE.

60,000 LBS. "HARVARD."

Furnished with Riehlé Patented Wedge Grips, for Securing a Straight Pull on Flat Specimens (Pat. Nov. 8th, 1881), and Patented Vernier Poise (Pat. Aug. 16th, 1887).

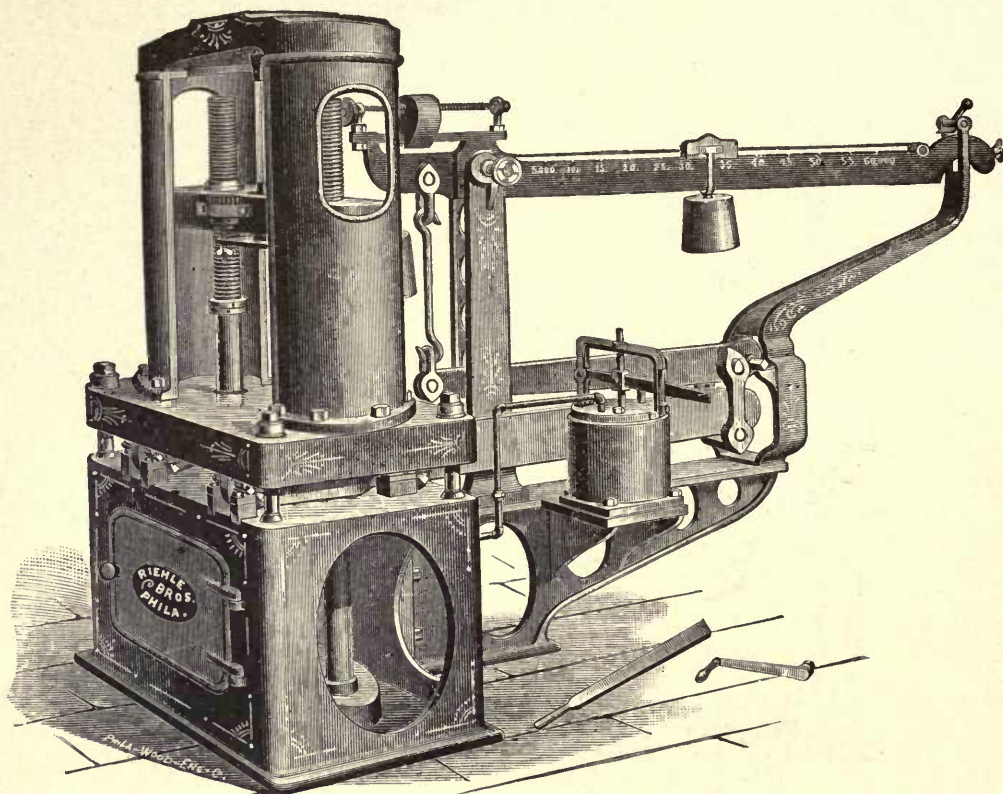


Plate No. 23.

## DIMENSIONS.

Extreme Height, . . . . .	5 ft. 10 in.
Extreme Length, . . . . .	6 ft. 10 in.
Extreme Width, . . . . .	3 ft. 0 in.
Weight, . . . . .	3,400 lbs.
Shipping Weight, . . . . .	3,600 lbs.

## ADAPTATION.

Tensile Specimens, . . . . .	24 in. long or less to 6 in. long.
Round " . . . . .	1 1/8 in. diameter or less.
Square " . . . . .	1 in. square or less.
Flat " . . . . .	2 1/2 x 3/4 in. or less.
Transverse " . . . . .	20 in. long or less.
Compression Specimens, . . . . .	26 in. long or less.
" Surfaces are steel-plates, . . . . .	2 in. diameter.
Motion of Plunger, . . . . .	8 in.

### Telegraph.

Chaplin. Capacity, 60,000 lbs. With Tensile Tools for Round, Square, and Flat Specimens. Price, \$	
Converse. Transverse Tools, extra. Price, . . . . .	\$
Blabon. Compression Tools, extra. " . . . . .	\$
University. The Vernier Poise as shown in illustration, propelled by a chain, is extra, next. Price, \$	
Cleveland. Capacity, 100,000 lbs. With Tensile Tools for Round, Square, and Flat Specimens. Price, . . . . .	\$
Additional for Transverse Compression Tools, . . . . .	\$

## DESCRIPTION AND OPERATION.

This machine has been made in many sizes and with hand and power hydraulic pumps. The lower cross-head is worked up and down the two main screws by an ingenious device that is always ready for operation, and does its part quickly and accurately. The power is applied to the specimen by hydraulic pump and jack. The pump gives a steady flow, insuring a fair and even pull on the test-piece. The plunger is returned to its original position by means of a spring arrangement extending beneath the floor. Any other suitable device can be provided if preferred. The poise is moved along the weighing-beam by means of a chain and performs its functions in an especially satisfactory manner. It is well designed and carefully built with the best material and in a workmanlike manner.

One great convenience of this machine is that the operator can weigh and pump continuously, and with ease, at the same time. Made in 10,000 lbs., 20,000 lbs., 30,000 lbs., 40,000 lbs., 50,000 lbs., 60,000 lbs., 100,000 lbs. capacities. Beam reads to 10 lbs. by the Vernier.

### IN USE BY

U. S. NAVY YARD, . . . . .	Mare Island, Cal.	JACKSON & WOODIN MFG. CO., . . . . .	Be:wick, Pa.
HARVARD UNIVERSITY, . . . . .	Boston, Mass.	AND OTHERS. (See folios 3, 4, 5, 6. Paragraphs 1 and 8.)	



RIEHLÉ VERTICAL HYDRAULIC POWER TESTING MACHINE.

50,000 LBS. "VANDERBILT."

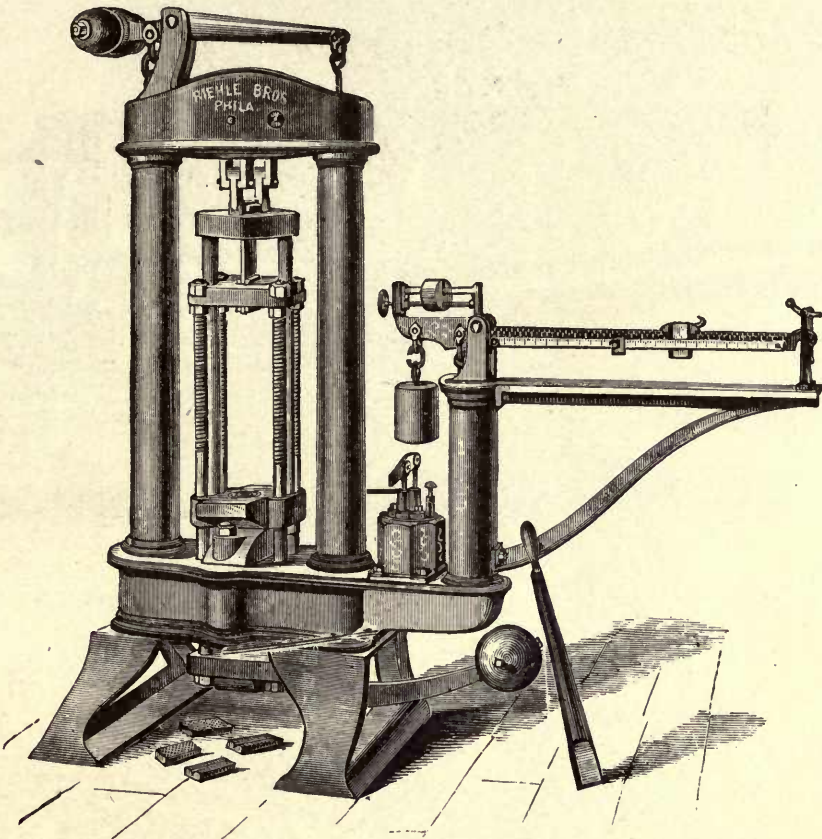


Plate No. 6.

DIMENSIONS.

Extreme Height, . . . . .	8 ft.
Extreme Length, . . . . .	7 ft.
Extreme Width, . . . . .	2 ft. 6 in.
Weight, . . . . .	2,250 lbs.
Shipping Weight, . . . . .	2,825 lbs.

ADAPTATION.

Tensile Specimens, . . . . .	6 in. to 24 in. long.
Round Specimens, . . . . .	1 in. diam. or less.
Square Specimens, . . . . .	1 in. x 18 in. or less.
Flat Specimens, . . . . .	2 in. or less x 3/8 in. or less.
Transverse Specimens, . . . . .	12 in. long.
Compression Specimens, . . . . .	20 in. high or less.
Compression Surfaces, . . . . .	6 in. x 6 in.
Motion of Plunger, . . . . .	8 in.

Telegraph.	
Vanderbilt.	With Tensile Tools for Round, Square, and Flat Specimens, . \$
Astor.	" 3 Plunger Hand or Power Pump, extra, . . . . .

Transverse Tools,	Compression Tools,
Extra.	Extra.
\$	\$

IN USE BY

HARRISBURG CAR MAN'G CO., . . . . .	Harrisburg, Pa.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Buffalo, N. Y.
McKEE, FULLER & CO., . . . . .	Catasauqua, Pa.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Baltimore, Md.
BALTIMORE CAR WHEEL CO., . . . . .	Baltimore, Md.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Pittsburgh, Pa.
WILLIAM KNABE & CO., . . . . .	Baltimore, Md.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Wheeling, W. Va.
VANDERBILT UNIVERSITY, . . . . .	Nashville, Tenn.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Cincinnati, O.
CANADIAN LOCOMOTIVE WORKS, . . . . .	Kingston, Can.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Detroit, Mich.
THE LANE & BODLEY CO., . . . . .	Cincinnati, O.	SUPT. INSP. OF STEAM VESSELS, . . . . .	St. Paul, Minn.
SOLID STEEL CO., . . . . .	Alliance, O.	SUPT. INSP. OF STEAM VESSELS, . . . . .	Louisville, Ky.
PITTSBURGH BESSEMER CO., . . . . .	Pittsburgh, Pa.	SUPT. INSP. OF STEAM VESSELS, . . . . .	St. Louis, Mo.
W. W. KURTZ & CO., . . . . .	Coatesville, Pa.	SUPT. INSP. OF STEAM VESSELS, . . . . .	San Francisco, Cal.
C. J. A. DICK, . . . . .	Christiana, Norway.	SUPT. INSP. OF STEAM VESSELS, . . . . .	New Orleans, La.

AND OTHERS. (See folios 3, 4, 5, and 6, paragraphs 1 and 2.)



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ IMPROVED LEVER CHAIN TESTING MACHINE.

300,000 LBS. "AURORA."

FOR APPLYING TENSILE STRAIN TO CHAIN, BRIDGE IRONS, WIRE OR HEMP ROPE, ETC., ETC.

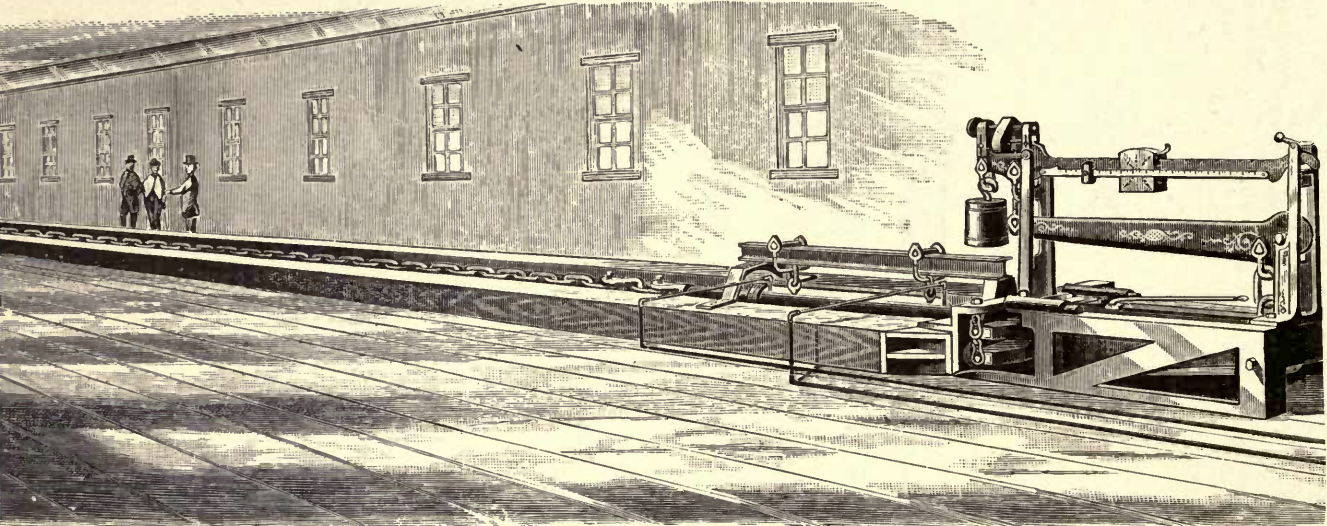


Plate No. 22.

DIMENSIONS.

Extreme Height, . . . . .	5 ft. 6 in.
Extreme Width, . . . . .	3 " 7 "
Extreme Length, . . . . .	9 " 10 "
This does not include length of trough nor hydraulic jack.	
Shipping Weight, . . . . .	14,175 lbs.
(Extreme length of machine as shown above is 100 ft.)	

ADAPTATION.

Tensile Tests, . . . . .	20 in. to 90 ft. or longer.
Square Specimens, . . . . .	2 1/2 in. or less.
Transverse Specimens, . . . . .	12 in. and over.
Compression Specimens, . . . . .	80 ft. or less.
Round Specimens, . . . . .	2 1/2 in. or less.
Flat Specimens, . . . . .	3 1/2 in. or less by 1 in. or less.
Motion of Plunger, . . . . .	5 ft.

PRICES.

Telegraph.	Adapted to tensile strain of chain, etc., with double-acting power pump.		Tools for Crushing.	Tools for Transverse Strain of Small Specimens.	Chain Tools.	Wire Rope Tools.
Missouri. Capacity, 100,000 lbs.	These machines are provided with pins at each end to receive shackles for chain, etc.	\$	\$	\$	\$	\$
Welsh. " 200,000 "		\$	\$	\$	\$	\$
Aurora. " 300,000 "		\$	\$	\$	\$	\$
Admiral, " 400,000 "		\$	\$	\$	\$	\$

Tools for testing Round, Square, and Flat Specimens, with Riehlé's Patented Clamp Wedges for Flat Specimens, extra. net.

DESCRIPTION AND OPERATION.

This Chain Testing Machine is arranged with the Power and Weighing Levers all at one end. The Power is applied by Hydraulic Pump as shown. Power Hydraulic Pump shown and described on folio 41, Plate No. 206, is used on this Testing Machine. Specimens of any length can be tested by SPECIAL APPLIANCES, to secure one end of the Specimen. This form of Testing Machine is made in several sizes, from 400,000 lbs. capacity to 100,000 lbs. Smaller and larger size machines can be made if desired.

A good foundation must be provided for this and all Horizontal Testing Machines.

IN USE BY

P. HAYDEN SADDLERY HARDWARE CO.,	200,000 lbs.,	Columbus, Ohio.
U. S. NAVY YARD,	400,000 "	Boston, Mass.
GOULD ST. FORGE CO.,	200,000 "	Buffalo, N. Y.
CHICAGO, QUINCY & BURLINGTON R. R.,	100,000 "	Aurora, Ill.
NIXDORFF-KREIN MANFG. CO.,	100,000 "	St. Louis, Mo.
LEBANON CHAIN WORKS,	200,000 "	Lebanon, Pa.
BRADLEE & Co.,	300,000 "	Philadelphia, Pa.

AND OTHERS.



RIEHLÉ IMPROVED THREE PLUNGER HYDRAULIC PUMP.

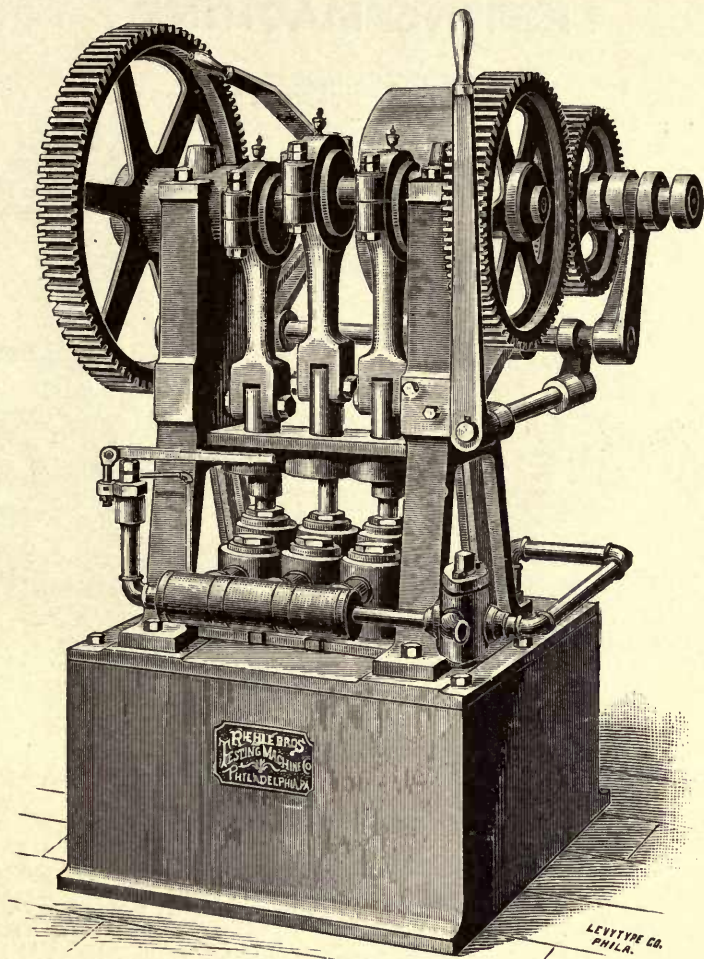


Plate No. 206.

DIMENSIONS.

Extreme Height, . . . . .	4 ft. 6 in.
Extreme Width, . . . . .	2 ft. 6 in.
Extreme Length (including Pulley), . . . . .	3 ft.
Diameter of Pulleys, . . . . .	16 in.
Face of Pulleys, . . . . .	6 in.
Weight, . . . . .	1,800 lbs.
Shipping Weight, . . . . .	1,925 lbs.

ADAPTATION.

Maximum Speed of Shaft, say 200 strokes per min.
Minimum Speed of Shaft, say 50 strokes per min.
Geared 1 to 1 1/3 and 1 to 5 1/3.
Capacity, with 1 1/8 diameter Plunger, 2-in. stroke, is 6 cubic in. per revolution of Eccentric Shaft.
One hundred revolutions of Pulley is 112 cubic inches slow speed.
Four hundred and fifty cubic inches is fast speed.

Tel.	
Jupiter.	Price, three Plunger, double gear, . . . . . \$
Juno.	“ two “ “ . . . . . \$
Venus.	“ two “ single “ . . . . . \$
Saturn.	“ for plain pump, . . . . . \$

DESCRIPTION AND OPERATION.

This is a very simple and practical power pump of steady flow and great capacity, and is very useful for any heavy hydraulic pumping. It is used with the “Riehlé” 100 and 200-ton Chain Testers.

The steady flow, so much desired by engineers for testing, is secured by placing the eccentrics at 120 degrees angles, which gives very little, if any, pulsation to the stroke.

The valves are all readily accessible without taking down any of the main parts of the pump, and power is applied in the simplest and most direct manner. This pump is furnished with a change of gears by which it can be run at either fast or slow speed, and a clutch pulley for stopping and starting.

Both gears and pulley are controlled by convenient levers.

This pump can be built in a somewhat cheaper form with only two plungers; also with a single set of gears for one speed only; or for light work, without any gearing, the driving pulley being direct on eccentric shaft.



# RIEHLÉ U. S. STANDARD HORIZONTAL CHAIN TESTING MACHINE.

50,000 LBS. "JEFFREYS."

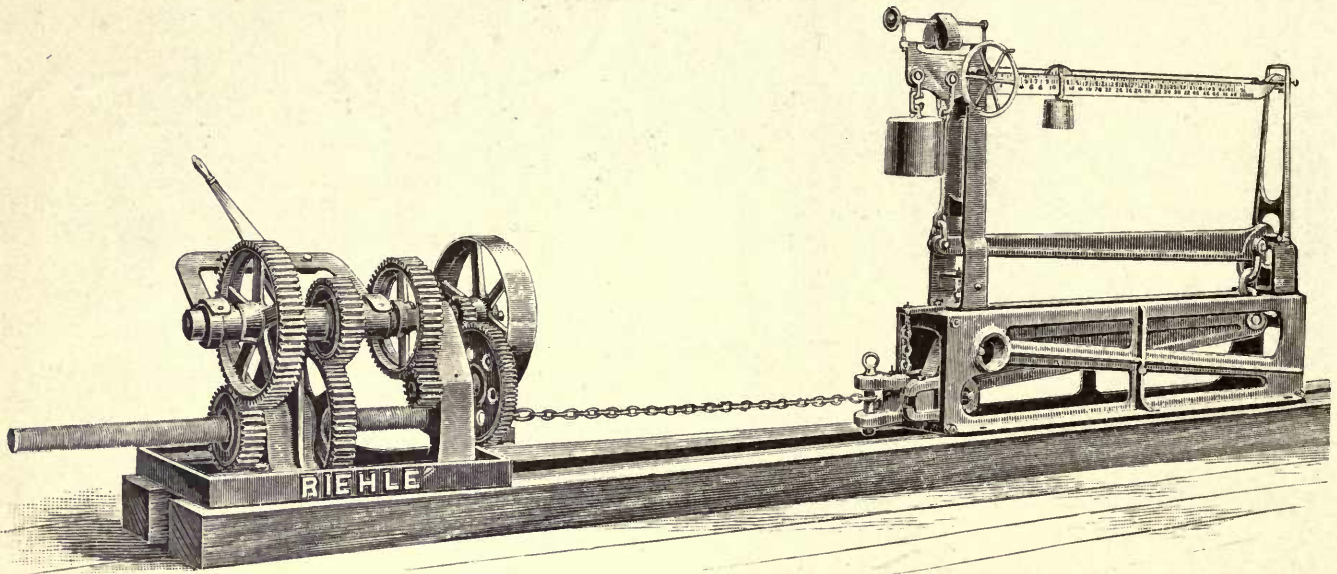


Plate No. 196.

## DIMENSIONS.

	Weighing End.	Power End.
Extreme Length, . . . . .	6 ft. 6 in.	2 ft. 6 in.
Extreme Height, . . . . .	4 ft. 6 in.	2 ft. 6 in.
Extreme Width, . . . . .	1 ft. 3 in.	2 ft.
Weight, . . . . .	1,200 lbs.	800 lbs.

## ADAPTATION.

Shortest Length of Specimen, . . . . .	1 ft.
Longest Length Specimen up to 100 ft. according to arrangements.	
Motion of Screw (as to length) say, . . . . .	6 ft.
Slowest Speed of Screws, . . . . .	1 in. in 5 min.
Quickest Speed of Screws, . . . . .	4 ft. in 1 min.

As the screw of this machine is operated by power, a change in speed can be increased by a change in the gearing and a cone pulley.

Telegraph.

Jeffreys. Price (without countershaft and without foundation), . . . . . \$

## DESCRIPTION AND OPERATION.

The Weighing Levers of this machine are at one end of the foundation and the power is at the other end. Specimens of different lengths can be tested by having suitable connections arranged between the pulley and power end.

For light testing this machine can be arranged on heavy timber, which can be placed either on the floor or secured to masonry work. In this photograph the machine is only arranged for short testing, and, in fact, merely placed close together to get the correct photograph at both ends. All the weighing and power parts of the machine are of metal (iron, steel, and brass). The Levers and Weighing-beam are adjusted to the Standard of the United States Government. As the specimen is strained, it is communicated through the Weighing Levers to the Weighing-beam, and the poise is moved out by the experimenter as in ordinary weighing. It is desirable to move the poise on the Weighing-beam simultaneously, as the power or strain on the specimen being tested increases, and by practice the beam can be kept in equilibrium throughout the operation of testing.

This machine can be arranged to operate by hand power instead of by belt and pulley. A hand wheel can be arranged near the weighing end so that one man can both apply the power and handle the Weighing-beam.

This Tester is suitable for testing any kind of material in long lengths (or short, with suitable appliances), such as manilla or hemp rope, or wire rope, or small iron and steel rods, or small chains.

In this engraving the machine is not shown "let into" the timber as it is when set up for work. It is usually set on a single heavy timber, flush with the floor.

## IN USE BY

P. HAYDEN SAD. II. Co., . . . . . Columbus, Ohio.  
CARLISLE CHAIN WORKS, . . . . . Carlisle, Pa.  
EWART MFG. Co., . . . . . Indianapolis, Ind.

JOHN GOOD (for rope), . . . . . New York.  
JEFFREYS MFG. Co., . . . . . Columbus, Ohio.

AND OTHERS.



# RIEHLÉ U. S. STANDARD HORIZONTAL HOOP-IRON TESTING MACHINE.

20,000 LBS. "WICK."

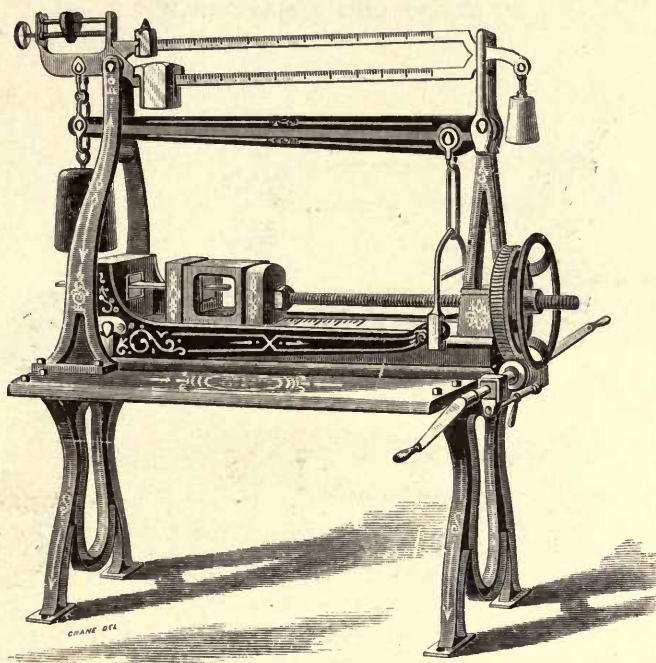


Plate No. 10.

## DIMENSIONS.

Extreme Height, . . . . .	5 ft. 9 in.
Extreme Length, . . . . .	7 ft.
Extreme Width, . . . . .	2 ft. 6 in.
Weight, . . . . .	1,100 lbs.
Shipping Weight, . . . . .	1,250 lbs.

## ADAPTATION.

Tensile Specimens, . . . . .	8 in. to 28 in. long.
Round " . . . . .	1/2 in. or less.
Square " . . . . .	1/2 in. or less.
Flat " . . . . .	3 in. or less x 1/4 in. or less.
Transverse " . . . . .	12 in.
Compression Specimens, . . . . .	6 in.
Motion of Screw, . . . . .	26 in.

Telegraph.

Wick. With tensile tools only. Price, . . . . . \$

## DESCRIPTION AND OPERATION.

The above Horizontal Machine is specially adapted for short specimens of small sizes of iron and steel specimens, also for hoop-iron. The power is applied by worm and gear, and operated by hand (or power if desired). The levers and beam are all sealed to the United States standard, and are sensitive and delicate, and act with rapidity and accuracy. A vernier furnished with the machine to indicate the stretch of the specimens. This style of machine is compact and ornamental, and suitable for an office.

## IN USE BY

LANDORE STEEL WORKS (bought by the late Dr. C. W. Siemens), . . . . . London, Eng.  
KIMBERLY, CARNES & Co., . . . . . Sharon, Pa.  
CARTWRIGHT McCURY, . . . . . Youngstown, Ohio.  
U. S. COTTON TIE CO., . . . . . Youngstown, Ohio.

WILLIAM CLARKE & Co., . . . . . Pittsburgh, Pa.  
STANDARD OIL CO., . . . . . New York.  
STANDARD OIL CO., . . . . . Bayonne, N. J.  
IMPERIAL REFINING Co., . . . . . Oil City, Pa.  
CLEVELAND REFINING Co., . . . . . Cleveland, Ohio.

AND OTHERS. (See Folios 3, 4, 5, and 6. Paragraphs 2 and 17.)

"Your 20,000 lbs. TESTING MACHINE is a very desirable instrument for testing steel bars of any size not exceeding one-half diameter, round section. The mechanical arrangements are well combined, and altogether the instrument is carefully finished and compact in form."  
LONDON. WM. SIEMENS.



# RIEHLÉ U. S. STANDARD HORIZONTAL WIRE TESTING MACHINE.



# RIEHLÉ PATENT WEDGE GRIP FOR TESTING MACHINES.

PATENTED NOVEMBER 8TH, 1881.

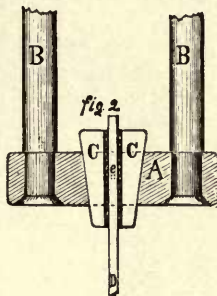
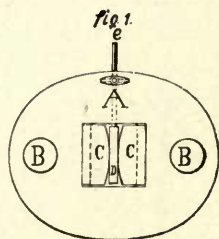


Fig. 4.

## DESCRIPTION.

Fig. 1 is a plan of Wedge Clamp, with specimens in position; C C, curved-face Wedges; D, specimens; E, is a pin that is used to guide the specimen to the centre of the testing tools. It is only added when specially ordered.

Fig. 2 is sectional view of same.

Fig. 3 is a modification of the wedge face.

Fig. 4 is a large engraving.

The inclination of the surfaces of wedges are exaggerated in the drawings so as to distinctly set forth their features.

The Patent high-face Wedge, as illustrated in cut to the right, is intended for gripping flat specimens in any testing machine provided with slotted holding heads.

The intelligent reader will see at a glance the design of the simple device.

The face of Wedge is highest through its centre, longitudinally, which causes the specimen to align itself instantly, and as the pressure increases the teeth penetrate and hold from the centre outward, and never from the edges inward, making it an impossibility to tear from the edges.

Those Wedges and Liners that have rounded backs or ball joints cannot prevent a side strain or torsion when the "bite" is firmer on one side of specimen, or when the opposite corners above and below are held more firmly. The slipping from dull teeth, or iron hard in spots, or from scaling, can never occur in the Riehlé Wedge to throw the specimen out of line. The complete failure of ball grips of all kinds is admitted; the scale, rust, or small particles settling in them causes their movement to stiffen, and if a specimen has not sufficient strength to align them, it breaks when out of plumb. The assertion can be safely made that no testing machine will pull a plain flat bar perfectly true with convenience and simplicity without this patented grip.

## IMPROVED FORM OF CAST-IRON SPECIMEN FOR TENSILE TESTS.

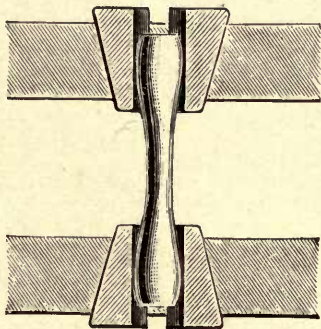


Plate No. 208.



Plate No. 209.



Plate No. 213.

## DESCRIPTION.

Plate No. 208 shows section of wedge tools and how the specimen is engaged, and that there is no possibility of the specimens being broken otherwise than in a direct line.

Plate No. 209 shows end view of same.

Plate No. 213 represents the latest improved form, for cast-iron specimens for tensile tests.



## BALL GRIP SPECIMEN HOLDERS FOR TESTING MACHINES.

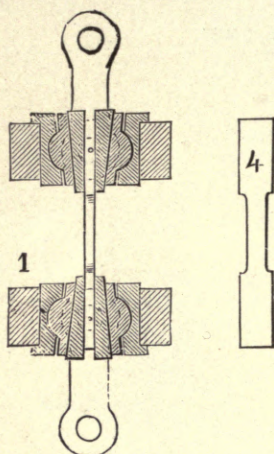


Plate No. 232.

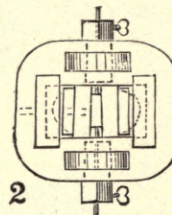


Plate No. 233.

*Telegraph.*

Ball Grip. Price, extra, . . . . . \$

Plate 232 is a sectional view of a self-adjusting Grip for holding square, round, or flat specimens. The wedges that hold the test-pieces bear against adjustable plates, which are provided with semi-spherical surfaces on their opposite sides. These surfaces bear in turn against the inside edge of the tools, which are concave, and of suitable proportions to admit of a free motion of the several corresponding parts.

These Grips have in some cases given satisfaction and in other cases proved a failure, mainly on account of the particles of iron that fly off as the specimen stretches and lodge back of the Grip, forming there a solid mass which prevents the wedges from moving as they are intended to. We also recommend the Riehlé Patent Wedge Grips for flat specimens as preferable to Ball Joint Wedges. The Riehlé Patent Wedge Grips are described on folio 45 of this catalogue.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ EXTRA HEAVY SPRING TESTING MACHINE.

80,000 LBS. "1892."

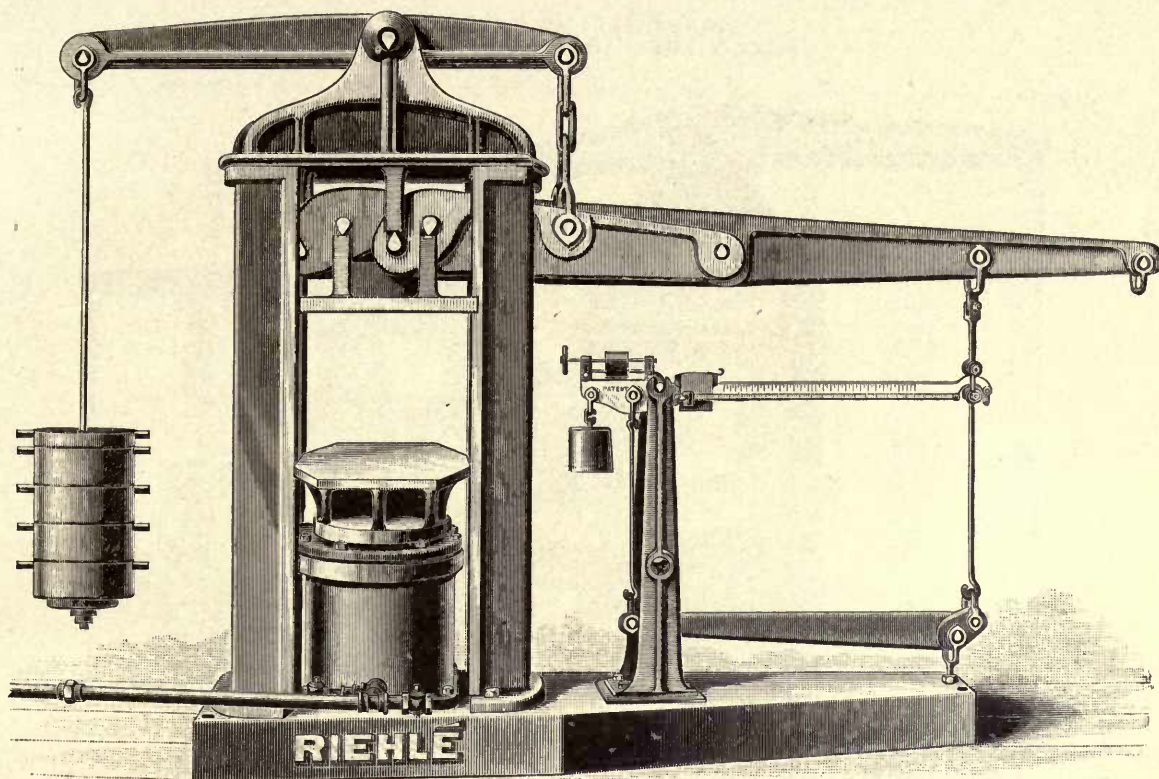


Plate No. 192.

## DIMENSIONS.

Extreme Height, . . . . .	8 ft. 0 in.
Extreme Width, . . . . .	4 ft. 6 in.
Extreme Length, . . . . .	13 ft. 0 in.
Weight (including Hydraulic Pump), . . . . .	11,000 lbs.
Shipping Weight (including Hydraulic Pump), . . . . .	11,600 lbs.

## ADAPTATION.

Compression Surface above, . . . . .	20 by 24 in.
Compression Surface below, . . . . .	24 in. by 4½ ft.
Space between Surfaces, . . . . .	20 in.
Dynamic Motion, . . . . .	1 in.
Motion of Plunger, . . . . .	12 in.
Maximum Speed of Plunger, . . . . .	12 in. per min.
Diameter of Cylinder, . . . . .	8 in.

## DESCRIPTION OF SPRING TESTER (AS SHOWN ABOVE).

This is a three-lever machine of a type similar to the regular line of Tensile Testing Machines, but inverted. It has three sets of bearings, which give it additional knife-edge support and a positive, even surface of compression, as the pressure is bound to be received fairly on three points of support. It also extends the surface on which a spring can be off the centre of platform.

### IN USE BY

DETROIT STEEL CO., . . . . . Detroit, Mich.

## DESCRIPTION OF POWER PUMP (NOT SHOWN IN ILLUSTRATION).

A double Plunger Power Pump, driven by direct-acting eccentrics, and with outside connected valves easily accessible at all times.

Diam. of Plungers, . . . . .	1⅞ in.
Stroke " " . . . . .	3 in.
Diam. of Pulley, . . . . .	22 in.
Face " " . . . . .	4 in.

120 pulley revs. equal 12 in. per min. Can also be made with two speeds, say, 6 in. and 12 in. per minute.

## DESCRIPTION OF GENERAL OPERATION OF MACHINE COMPLETE.

The operation of this machine is similar to that of improved Spring Testers. It is furnished with safety-valve attachment and relief valves for controlling the pressure. If ordered, measuring apparatus can be applied for measuring the compression, etc.

Telegraph.

Detroit. Price (complete with Power-Pump), . . . . . \$



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD SPRING TESTING MACHINE.

65,000 LBS. "READING."

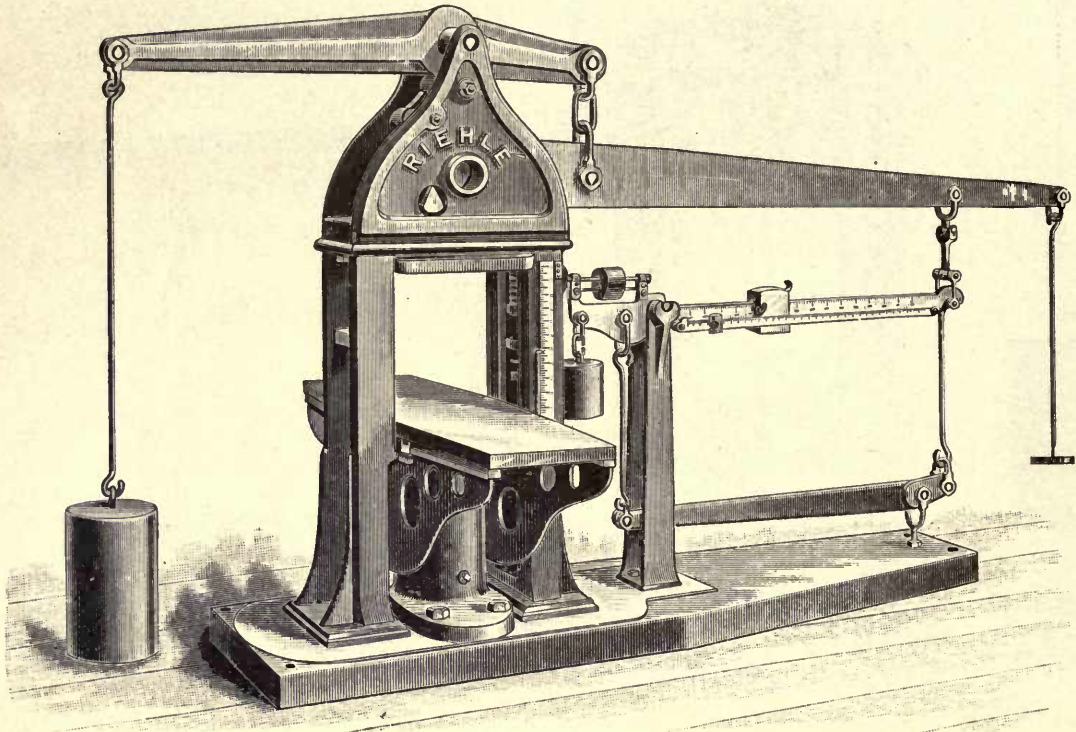


Plate No. 210.

## DIMENSIONS.

Extreme Height, . . . . .	6 ft.
Extreme Length, . . . . .	12 ft. 6 in.
Extreme Width, . . . . .	4 ft. 6 in.
Weight, . . . . .	7,000 lbs.
Shipping Weight, . . . . .	7,300 lbs.

## ADAPTATION.

Upper Compression Surface, . . . . .	16 in. x 16 in.
Lower Compression Surface, . . . . .	16 in. x 52 in.
Motion of Plunger, . . . . .	12 in.
Greatest Space between Compression Surfaces, . . . . .	18 in.
Minimum Space between Compression Surfaces, . . . . .	6 in.
Speed of Plunger, . . . . .	10 to 12 in per min.
Dynamic Motion, . . . . .	1 in.
Total Weight on Beam, . . . . .	30,000 to 65,000 lbs.
Main Beam, . . . . .	by 1,000 lbs.
Side Beam, . . . . .	by 10 lbs. up to 2,000.

*Tei.*  
Reading. Price (including power hydraulic pump, not shown in illustration), . . . . . \$

## DESCRIPTION AND OPERATION.

This Machine can be used without loose weights, having all the weight on the beam, or can have half on each. The beam can be disconnected, and long lever surged for the dynamic motion required. The Machine can be furnished with a measuring gauge for compression, if ordered extra.

The arrangement of safety and relief valves is such that the pump can be running all the time, and if the operator lets go of valve lever carelessly the pressure stops instead of accumulating.

## IN USE BY

BALTIMORE & OHIO RAILROAD, . . . . . Baltimore, Md.  
GREAT NORTHERN RAILWAY, . . . . . St. Paul, Minn.



RIEHLÉ U. S. STANDARD SPRING TESTING MACHINE.

30,000 LBS. "TOPEKA."

FOR ASCERTAINING THE ELASTICITY OF ALL KINDS OF SPRINGS UNDER PRESSURE.

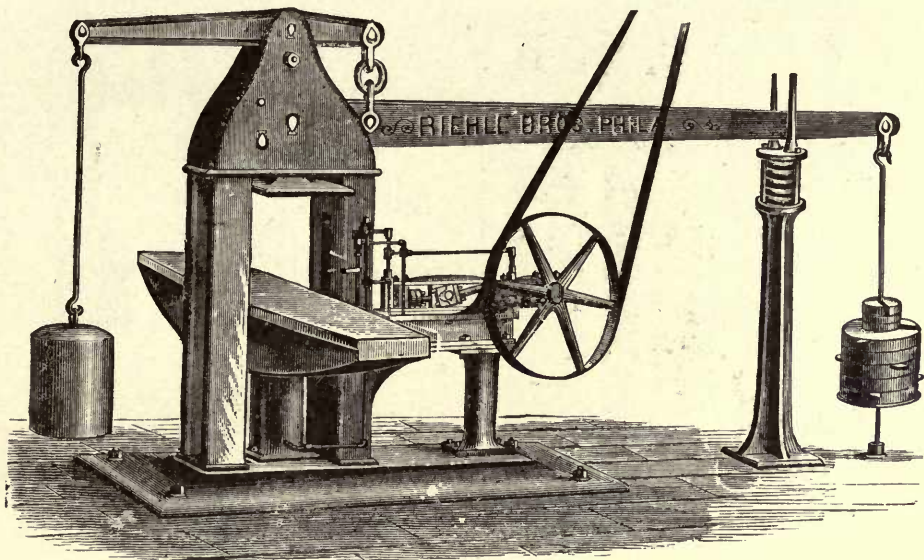


Plate No. 7 1/2.

DIMENSIONS,

Extreme Height, . . . . .	5 ft. 8 in
Extreme Length, . . . . .	11 ft.
Extreme Width, . . . . .	5 ft.
Weight, . . . . .	5,300 lbs.
Shipping Weight, . . . . .	5,650 lbs.

ADAPTATION,

Compression Surface above, . . . . .	16 in. x 16 1/2 in.
Compression Surface below, . . . . .	16 1/2 in. x 5 ft.
Space between Surfaces, . . . . .	1 ft. 10 in.
Dynamic Motion, . . . . .	1 1/4 in.
Motion of Plunger, . . . . .	10 in.

Telegraph.

Chicago.	10,000 lb. capacity with hand pump,	Price, . . . . .	\$
Atchison.	25,000 " " " power " " . . . . .	\$	
Topeka.	30,000 " " " " " " . . . . .	\$	

DESCRIPTION AND OPERATION,

The above illustration is of a Machine precisely similar to the one shown on previous page, excepting that the lower table is extended so as to take in a long spring. Either pattern of our Spring Testers can have the tables extended in that manner. The Machines are built in the most substantial manner and finished in the best style. These Machines can be arranged with Weighing Beams as shown on Plate No. 210.

IN USE BY

ATCHISON, TOPEKA & SANTE FÉ R. R. Co., Topeka, Kan., . . . . .	40,000 lbs.
BALTIMORE & OHIO R. R., Baltimore, Md., . . . . .	40,000 lbs.
ATCHISON SPRING WORKS, Chicago, Ill., . . . . .	50,000 lbs.
AND OTHERS. (See folios 3, 4, 5, and 6; paragraphs 4 and 11.)	



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ IMPROVED DUPLEX SPRING TESTING MACHINE.

25,000 LBS. (EACH PLUNGER), "ALTOONA."

FOR TESTING THE ELASTICITY OF CAR AND OTHER SPRINGS, BY COMPRESSION.

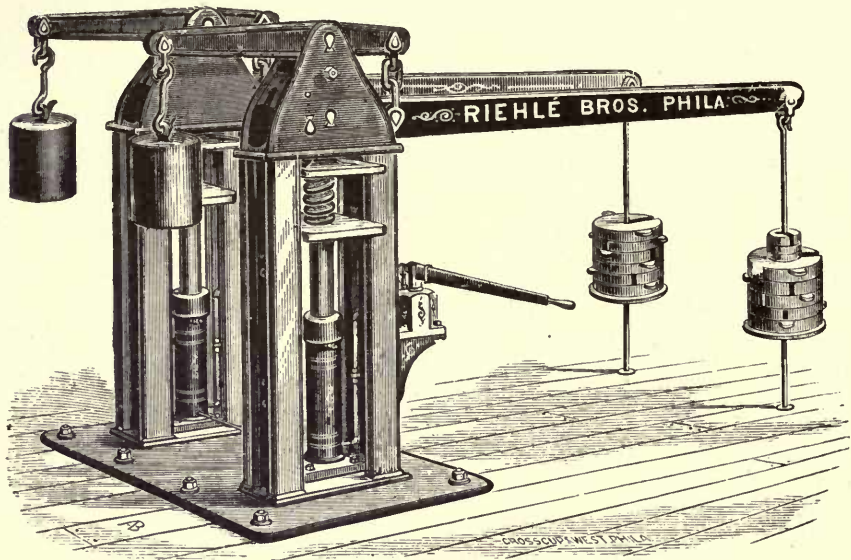


Plate No. 8.

DIMENSIONS.

Extreme Height, . . . . .	6 ft. 6 in.
Extreme Length, . . . . .	10 ft.
Extreme Width, . . . . .	5 ft. 2 in.
Weight, . . . . .	9,875 lbs.
Shipping Weight, . . . . .	11,000 lbs.

ADAPTATION.

Compression Surfaces for Springs, . . . . .	16½ in. x 10 in.
Motion of Plunger, . . . . .	20 in.
Dynamic Movement, . . . . .	1¼ in.

Telegraph.  
Altoona. Capacity of each Plunger, 25,000 lbs. . . . . \$

DESCRIPTION AND OPERATION.

This Machine is constructed entirely of Iron, Brass, and Steel, and is very stout. Two springs can be tested at the same time, and their comparative qualities and working capacity determined. Each plunger has a capacity of 25,000 lbs., and both are worked with one hydraulic pump. The springs to be tested are placed upon the two tables. The upper tables, as in all our Improved Spring Testing Machines, bear against knife edges and weighing levers, and the power applied by the hydraulic pump and jack to the lower tables and through the springs that are being tested against the upper tables are then counterbalanced by the levers and weights and the strength of the springs arrived at. The levers and weights are all sealed to the United States Standard, and the arrangement of the levers such as to insure the least possible friction, and the accuracy of the machine can be relied upon.

IN USE BY

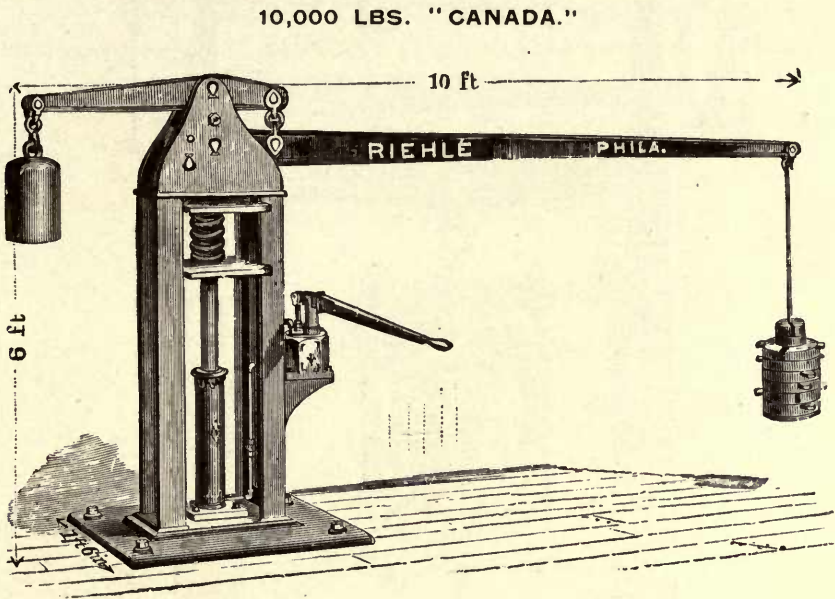
PENNSYLVANIA RAILROAD CO.'S TESTING LABORATORY, . . . . . Altoona, Pa.  
CLIFF, RIGHTER & CO., . . . . . Oswego, N. Y.  
AND OTHERS. (See folios 3, 4, 5, and 6.)

"Excellent satisfaction." Cliff, Righter & Co. The SPRING TESTING MACHINE purchased of you some years ago is still in daily service, and gives excellent satisfaction.  
OSWEGO, N. Y.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD SPRING TESTING MACHINE.



This machine can be arranged with weighing beam as shown on Plate No. 210.

Plate No. 9.

DIMENSIONS.

Extreme Height, . . . . .	6 ft.
Extreme Length, . . . . .	10 ft. 6 in.
Extreme Width, . . . . .	1 ft. 4 in.
Weight, . . . . .	1,755 lbs.
Shipping Weight, . . . . .	1,900 lbs.

ADAPTATION.

Compression Surfaces, . . . . .	12 in. x 12 in.
Distance Between Surfaces, . . . . .	2 ft. 2 in.
Dynamic Motion, . . . . .	1 1/4 in.
Motion of Plunger, . . . . .	17 in.

Telegraph.  
Canada. Price, . . . . . \$

DESCRIPTION AND OPERATION.

This machine is built entirely of iron, with steel fulcrums and bearings. The mode of operating is very simple, the power being applied with great ease, and may be withdrawn instantly after testing the specimen. By the use of proper appliances elliptic and semi-elliptic springs of all sizes and shapes may be tested on this machine. The power is produced with a hydrostatic pump. The plunger with its table (whereupon the spring is placed to undergo the test) is forced upward toward the upper table. The pressure thus being applied is communicated to the main beam (which is adjusted to a balance like an ordinary scale) by accurate weighing mechanism, each lever being regulated to the United States standard. The beam is kept in equipoise by simultaneously operating the pump and placing weights on the dish at the end of the beam. The dynamic movement (one inch) to test the springs while under pressure is, we believe, greater in this machine than in any other tester made.

IN USE BY

GRAND TRUNK RAILWAY CO., . . . . . Montreal, Canada.	GRAND TRUNK RAILWAY, Herbert Wallis, Mechanical Superintendent,
CHICAGO & NORTHWESTERN RAILROAD CO., . . . . . Chicago, Ill.	Montreal: <i>The Spring Tester we purchased from you has given entire satisfaction.</i>

Extract from letter Thomson Electric Welding Co., Lynn, Mass.—“You can refer to us for the working of the 100,000 lbs. Testing Machine (Plate No. 34) ; it gives us perfect satisfaction, and we are using it constantly.”



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ SPRING COMPRESSION TESTER.

5,000 LBS. CAPACITY, "PURITAN."

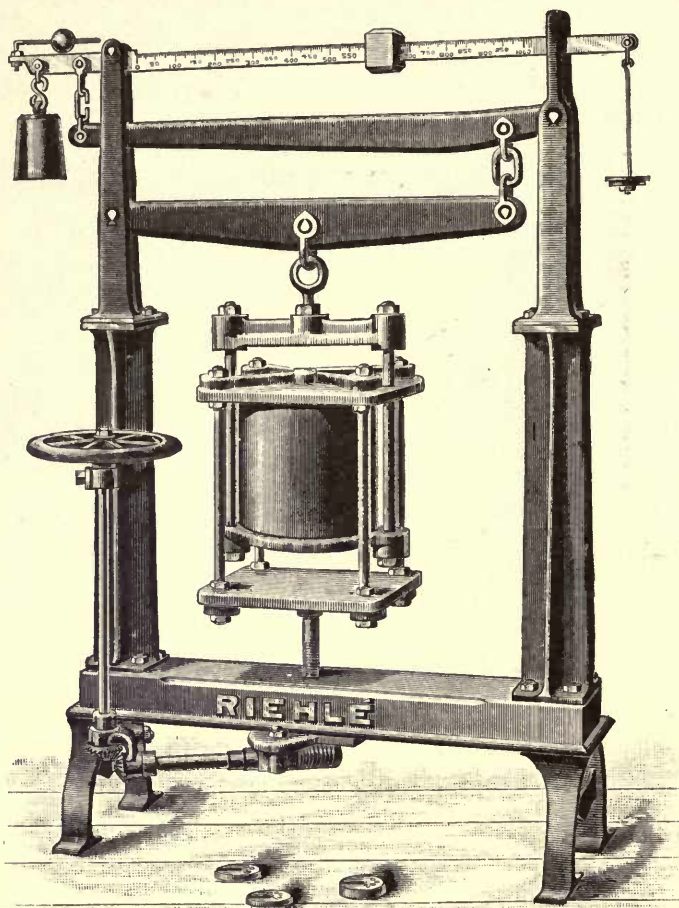


Plate No. 239.

Tools for Round and Square Specimens.



Plate No. 268.

Telegraph.  
Speedwell. Price, \$

## DIMENSIONS.

Extreme Length, . . . 5 ft. 0 in.  
Extreme Height, . . . 6 ft. 4 in.  
Extreme Width, . . . 2 ft. 4 in.  
Weight, . . . . . 555 lbs.  
Shipping Weight, . . . 650 lbs.

Tools for Flat Specimens.



Plate No. 269.

Telegraph.  
Mayflower. Price, \$

## ADAPTATION.

Rubber Springs 12 in. diameter,  
12 in. high for compression.  
Flat Specimens for Tensile  
Tests, 12 in. long and less by  
2 in. wide.  
Round and Square Specimens  
for Tensile Tests, 12 in. long  
and less by 1/4 in. and less.

## DESCRIPTION AND OPERATION.

This Compression Testing Machine is arranged with the weighing beam and system of multiplying levers, all tested and regulated in accord with the United States standard of weights, at Washington, D. C., and delicately adjusted to weigh the strain exerted on the specimen. The power exerting the strain on test-piece is produced by a worm and gear, which can be disengaged and the plain hand-wheel used when desired for speed.

The above machine can be arranged for making tensile tests of specimens of belting by using the proper tools (Plate No. 269); also for testing wire (Plate No. 268). By proper appliances any material can be tested up to the capacity of the machine. Of course, this machine can be used without having the compression tests at all; that is, used for tensile machine.

The specimen in process of testing is clearly shown in the above illustration, resting upon the platform of metal suspended from the lower lever of the machine.

The strain upon the test-piece is produced by turning the wheel below in front of the frame, which causes the stirrup, which is located at the centre point of specimen, to bear down upon the same, and the strain thus produced is transmitted to the weighing-beam through the intermediate lever.

The weighing-beam must be kept in equipoise by shifting the poise, the power being applied simultaneously with the movement of the poise, and continuing the operation until the test is concluded. Care must be taken that the weighing-beam is balanced before the testing is begun, or the test-piece in position. Additional standard weights are supplied to suspend on the small end of the weighing-beam, as occasion requires, to balance the strain up to the full strength of the test-specimen.

Telegraph.  
Puritan.

Capacity.  
5,000 lbs. (with compression tools only, as illustrated). Price, . . . . . \$  
Constructed entirely of metal.

## IN USE BY

Boston Rubber Co., . . . . . Boston, Mass.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD TRANSVERSE TESTING MACHINE.

5,000 LBS. "SEBASTOPOL."

(EVERY FOUNDRY SHOULD HAVE ONE FOR TESTING SAMPLE BARS OF CAST IRON.)

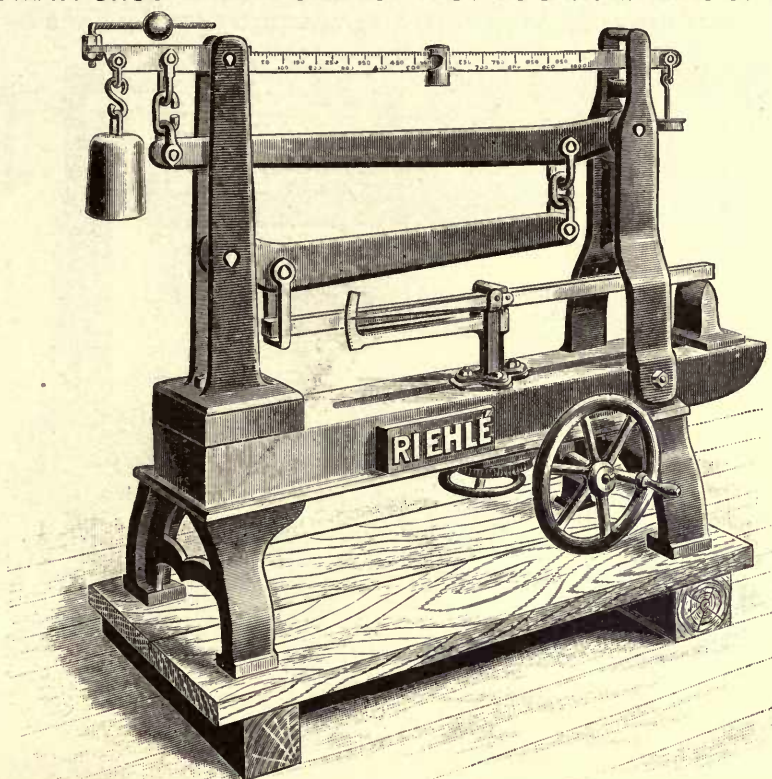


Plate No. 219.

## DIMENSIONS.

Extreme Length, . . . . .	5 ft. 6 in.
Extreme Height, . . . . .	3 ft. 10 in.
Extreme Width, . . . . .	1 ft. 6 in.
Weight, . . . . .	600 lbs.
Shipping Weight, . . . . .	680 lbs.

*Telegraph.*

Sebastopol.	Constructed entirely of metal, Price, . . . . .	\$
Indicator.	Indicator, for elastic limit, extra, net, . . . . .	\$

## ADAPTATION.

Transverse Specimens, 12 in. to 48 in. This Machine can be arranged to test longer specimens, at extra cost.  
An indicator, to show elasticity of specimens being tested, can be added.

## DESCRIPTION.

This Testing Machine is arranged with multiplying levers and weighing beam, and the power exerted by Worm Gear. By some change in the length of frame and an extension at the end, still longer specimens can be tested. As in all the Riehlé Screw Power Testing Machines, the power exerted upon the specimen is brought to bear upon the system of weighing levers, and the strain noted on the beam, as in an ordinary platform scale. The Indicator shows the deflection of the specimen; and by observing its movements, the properties of a specimen being tested can be noted and recorded for reference. This machine is of the finest workmanship and best construction.

## OPERATION.

When the specimen is placed in position, the levers of the machine being balanced with the Poise at Zero, adjust the pointer of the indicator at O. Revolve the hand wheel, which applies the strain, and as the Beam raises move out the Poise. Keep the Beam in equipoise by the simultaneous addition of the power or strain, and the operation of the Poise until the specimen breaks or has been tested to the desired strain. The proper strain is being weighed only while the Beam is in exact equipoise. Additional standard weights are applied to suspend on the small end of the weighing beam as occasion requires.

*The calculations are made so that the beam registers the centre load.*  
(See folios 3, 4, 5, and 6, paragraphs 6, 7, 8, 9, 10, and others.)

## IN USE BY

PETTEE MACHINE WORKS, . . . . . Upper Newton Falls, Mass.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD TRANSVERSE TESTING MACHINE.

5,000 LBS. "WATERLOO."

(EVERY FOUNDRY SHOULD HAVE ONE FOR TESTING SAMPLE BARS OF CAST IRON.)

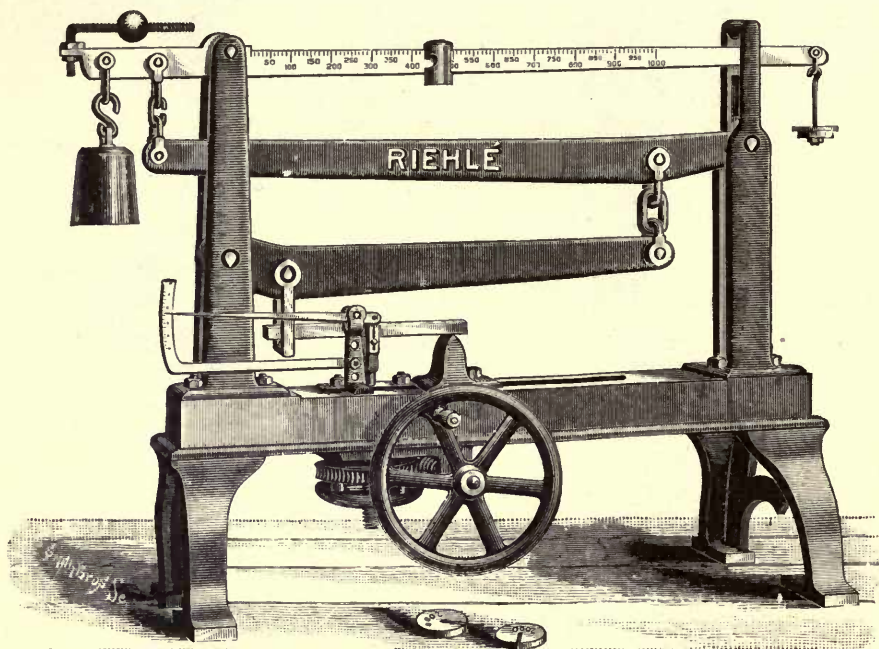


Plate No. 13.

## DIMENSIONS.

Extreme Length, . . . . .	4 ft. 10 in.
Extreme Height, . . . . .	3 ft. 8 in.
Extreme Width, . . . . .	1 ft. 6 in.
Weight, . . . . .	425 lbs.
Shipping Weight, . . . . .	480 lbs.

## ADAPTATION.

Transverse Specimens, 12 in. to 24 in. This Machine can be arranged to test longer specimens, at extra cost.  
An indicator, to show elasticity of specimens being tested, can be added.

### Telegraph.

Waterloo.	Constructed entirely of metal, Price, . . . . .	\$
Indicator.	Indicator, for elastic limit, extra, net, . . . . .	\$

## DESCRIPTION.

This popular Transverse Testing Machine is arranged with the weighing beam and system of multiplying levers, all tested and regulated in accord with the United States Standard of Weights at Washington, D. C., and delicately adjusted to weigh the strain exerted on the specimen. The power exerting the strain on test-piece is produced by a worm and gear, which can be disengaged and the plain hand-wheel used when desired for speed. The best of materials are used, and the workmanship is first-class in every particular.

## OPERATION.

The specimen in process of testing is clearly shown in the above illustration, one end resting upon a **A** shaped piece of metal, the other end being suspended from the lower lever of the machine.

The strain upon the test-piece is produced by turning the wheel below in front of the frame, which causes the stirrup, which is located at the centre point of specimen, to bear down upon the same, and the strain thus produced is transmitted to the weighing-beam through the intermediate lever.

The weighing-beam must be kept in equipoise by shifting the poise, the power being applied simultaneously with the movement of the poise, and continuing the operation until the test is concluded. Care must be taken that the weighing-beam is balanced before the testing is begun, or the test-piece in position. Additional standard weights are supplied to suspend on the small end of the weighing-beam, as occasion requires, to balance the strain up to the full strength of the test-specimen.

*The calculations are made so that the beam registers the centre load.*

In use by many leading foundries and machinists. (See folios 3, 4, 5, and 6, paragraphs 6, 7, 8, 9, 10, and others.)



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD TRANSVERSE TESTING MACHINE.

3,000 LBS. "CHALLENGE."

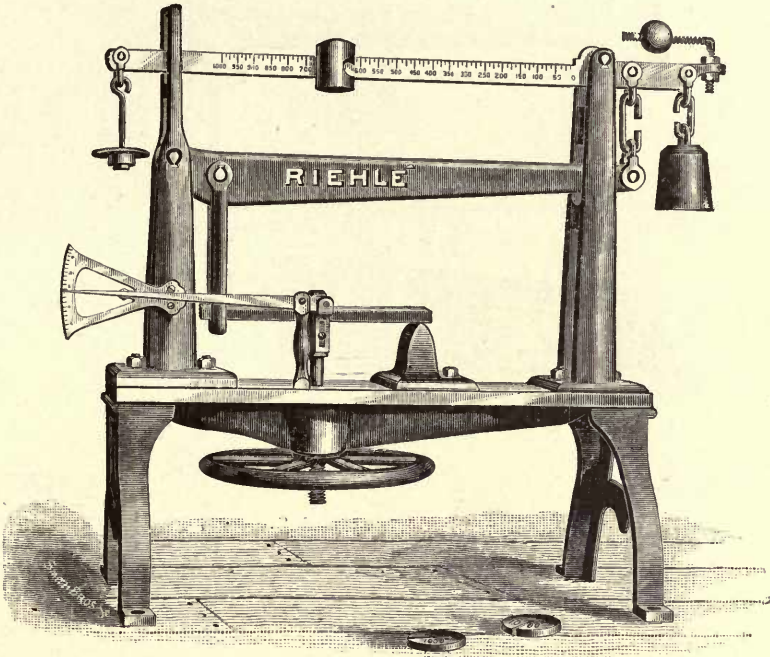


Plate No. 26.

DIMENSIONS.

Extreme Length, . . . . .	3 ft. 2 in.
Extreme Height, . . . . .	3 ft. 1 in.
Extreme Width, . . . . .	1 ft. 4 in.
Weight, . . . . .	200 lbs.
Shipping Weight, . . . . .	230 lbs.

ADAPTATION.

Transverse Specimens, . . . . . 12 in. long.  
An Indicator to measure the elasticity of specimens is shown in illustration, but not furnished with machine unless specially ordered.

Telegraph.	
Indianapolis.	Constructed entirely of metal, Price, . . . . . \$
Indicator.	Indicator for Elastic Limit, extra, net, . . . . . \$

DESCRIPTION.

This illustration represents so faithfully the general appearance of this useful machine that further description is unnecessary. The specimen is shown in position. The weighing-beams and levers are all carefully sealed to the standard of the *United States Government*, and guaranteed to be accurate and reliable.

OPERATION.

The weighing-beam must be balanced before the specimen is arranged for testing. The wheel shown must be moved from left to right, and, as the beam raises, the poise must be moved out to restore the equipoise. If more strain is required to break the specimen than can be weighed by the poise, move the poise back to zero, and place the loose weight on the weight dish shown at the extreme left (small end) of weighing-beam, and move the poise out as before, until the test is completed. The calculations are made so that the beam registers the centre load.

IN USE BY

Capacity.		Capacity
INDIANAPOLIS CAR AND MANUFACTURING CO., Indianapolis, Ind., . . . . .	2,500 lbs.	SOUTHWESTERN IRON CO., Louisville, Ky. (with Indicator), 3,000 lbs.
FALES & JENKS, Providence, R. I., . . . . .	2,500 "	ALBION IRON WORKS CO., Victoria, B. C., " 3,000 "
HITCHINGS & CO., New York, N. Y., . . . . .	2,500 "	EMERSON, TALCOTT & CO., Rockford, Ill., " 3,000 "
BROWN & PATTERSON, Brooklyn, E. D., N. Y., . . . . .	2,500 "	COLORADO COAL AND IRON CO., Bessemer, Col., " 3,000 "
CHAS. PARKER & CO., Meriden, Conn., . . . . .	3,000 "	YALE COLLEGE, New Haven, Conn., " 3,000 "
		SMEAD & CO., Toledo, Ohio, 3,000 "
AND OTHERS. (See Folios 3, 4, 5, and 6.)		



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD VERTICAL WIRE TESTER.

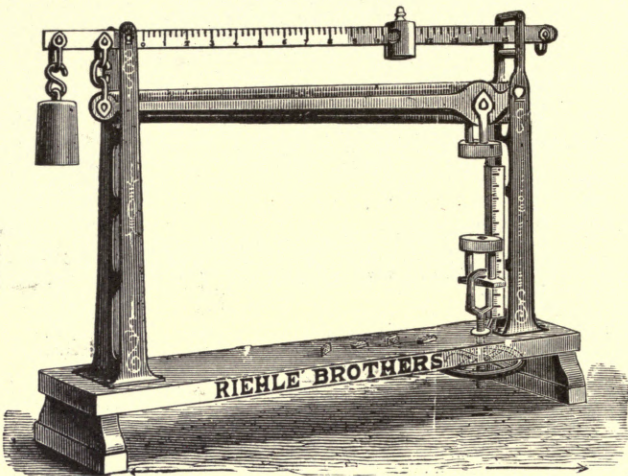


Plate No. 17.

DIMENSIONS.

Extreme Height, . . . . .	4 ft.
Extreme Length, . . . . .	5 ft.
Extreme Width, . . . . .	20 in.
Weight, . . . . .	175 lbs.
Shipping Weight, . . . . .	220 lbs.

ADAPTATION.

Round, Square, or Flat Specimens by Tensile Strain, 12 in. long or shorter.	
Motion of Screw, . . . . .	. 6 in.

Telegraph.			
Ansonia.	Capacity, 4,000 lbs.	Price, . . . . .	\$
Dudley.	Capacity, 2,000 lbs.	" . . . . .	\$

DESCRIPTION AND OPERATION.

The above machine is constructed of iron, steel, and brass, with wooden base. It is adapted for testing band iron, wire, and other materials by tensile strain. It is furnished with a rule for indicating the stretch of the material down to one-tenth of an inch. The power is produced by a ratchet under the shelf, which exerts a strain on the specimen which is communicated through the upper tools and lever to the weighing-beam, and there registered. The weighing-beam must be kept in equipoise during the process of testing to insure correct results. It is now mounted on iron legs.

For names and addresses of parties using these machines please see folios 3, 4, 5, and 6. Paragraph 13.

UNITED STATES STANDARD WEIGHTS.

CAPACITY 50 LBS.

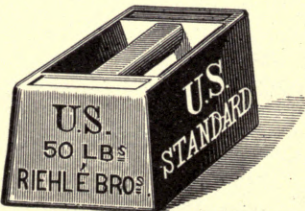


Fig. 50.

Telegraph.			
Thaw.	Made of Cast Iron.	Price, . . . . .	\$
	By the quantity	cts. per lb.	56







## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

### DESCRIPTION.

The "U. S. Standard" Cement Testing Machine was designed after a thorough examination of the most approved forms of machines in use in this country and in Europe, with ADDITIONS and IMPROVEMENTS introduced by us to suit the requirements of American Engineers and Manufacturers. The Machine, as now constructed, was made according to specifications given by the Chief Engineer of the Department of Public Works, of New York City, to test briquettes of one and two-inch areas, and was tested, by order of the Department, up to its full capacity of 1,000 lbs., with a Dynamometer especially adapted for the purpose, and found absolutely correct. Since that time all the Machines made by us have been constructed in conformity with the specifications aforesaid, and have never failed to perform their duty to the satisfaction of the parties using them. The claims of superiority of the "Standard" Machine over all others that have been offered to the public are based on the fact that it is constructed on strictly scientific principles, calculated to do the work rapidly, correctly, and, if necessary, at all times up to the full capacity of the Machine, viz.: 1,000 lbs., without danger of injuring it or impairing the working parts by constant use. To make a Machine more compact than the "Standard" necessitates the use of a complication of leverage, which tends to affect the accuracy of the Machine. All appliances of this kind have been studiously avoided by us, as the nature of the material to be tested DOES NOT ADMIT of a sacrifice of accuracy to possible convenience. The method adopted in the "Standard" of applying the strains by means of a pulling screw, and a traveling poise on the beam in the hands of the operator, who can use the power to be applied either fast or slow, as occasion may require, is the ONLY CORRECT METHOD OF TESTING A SUBSTANCE that varies in its consistency as much as cement. The "Standard" is *NOT AUTOMATIC*, but responds to every call made upon it, recording from 1 lb. to 1,000 lbs. with an accuracy that does not admit of adverse criticism.

The arrangement of the "Grips" on the "Standard" (SWINGING THEM ON PINS) is used only on this Machine, and requires no explanation or comment from us, as the advantages are perfectly apparent to any one who knows the inaccurate results consequent upon gripping a briquette of cement otherwise than on a "dead-straight line," which is impossible with the "Pin Grip." The "Standard" Grip can be used as readily on the 1-inch briquette recommended by the American Society of Civil Engineers (or any 1-inch briquette), as well as on the figure 8 briquette adopted by the Department of Public Works of New York City, thus giving engineers and others an opportunity of making comparisons if so disposed.

### OPERATION.

After the briquette is prepared it is placed in the grips, and, being carefully adjusted, the hand-wheel connected by a screw to the lower grip, is turned from left to right, and continued until the indicator of weighing beam (which moves in a gate at the top of the Machine and nearly on a line with the eye of the operator) drops. This indicator moves the reverse of the weighing beam, and when too much strain is exerted it falls, and when too much weight is applied it raises to the top of gate. It is important that the indicator should vibrate in the centre of the gate, and rest neither up nor down. This result can be attained by carefully manipulating the large hand-wheel and the simultaneous movement of the poise on the weighing beam. When the indicating beam drops down, when the test first begins, the rest of the test can usually continue without again moving the large hand-wheel, which is shown underneath the end of shelf. As is readily understood, the operator propels the poises backward and forward by means of the hand-wheel (at butt end of weighing beam) and cord passing around a pulley at the other end of machine. By a little practice a person gets very expert, and can make a test with facility.

### A FEW SPECIAL FEATURES OF THIS STYLE OF TESTING MACHINE.

- A.—The poise moves quietly and smoothly on weighing beam.
- B.—The weighing beam is long, and the marks not too close together. The slightest movement of the beam is promptly and plainly observed by the motion of the indicator.
- C.—All the parts of the "Standard" are uniform and interchangeable, and made by special machinery.
- D.—The levers are tested and sealed to U. S. Standard Weight.
- E.—Strength and simplicity in construction, convenience in operation, and accuracy of results.

The following articles are useful in preparing cements for testing, and can be furnished by Riehlé Bros. Testing Machine Co., at the annexed *net cash prices* (any article on this list can be ordered separately):

#### NEST No. 1. SAND TEST SIEVES.

Telegraph. Mace.	7½ in. in diam. No. 20 Sieve, 400 Meshes to the square in., No. 28 Stubb's Wire Gauge, . . . \$
Mackerel.	8 in. in diam. No. 30 Sieve, 900 meshes to the square in., No. 31 Stubb's Wire Gauge, . . . \$
Magnet.	Complete Nest, per set of two sieves, . . . \$

#### BRASS WIRE CLOTH AND BRASS FRAME.

#### NEST No. 2. CEMENT-TEST SIEVES.

Telegraph. Maderia.	6 in. diam. No. 50 Sieve, 2,500 Meshes to the square in., No. 35 Stubb's Wire Gauge, . . . \$
---------------------	-----------------------------------------------------------------------------------------------

Telegraph. Madonna.	6½ in. in diam., No. 74 Sieve, 5,476 Meshes to the square in., No. 37 Stubb's Wire Gauge, . . . \$
Magical.	7 in. in diam. No. 100 Sieve, 10,000 Meshes to the square in., No. 40 Stubb's Wire Gauge, . . . \$
Magnify.	Complete Nest, per set of three sieves, . . . \$

#### BRASS WIRE CLOTH AND BRASS FRAME.

Sieves made with tin frames, 10 per cent. less in cost.

Mist.	1 Special Scale (to ascertain fineness of cement), . . . \$
Mister.	1 Measuring Glass, 16 oz., . . . \$
Mason.	1 Mason Trowel, 8 in. (to mix cement), . . . \$
Measure.	1 Pointing Trowel (to make the briquette in mold), \$
Myrtle.	1 Mixing Table, 24 in. x 24 in., of glass (ground), \$
Mixing.	1 Mixing Table of Slate (Countersunk), . . . \$
Model.	1 Doz. Galvanized Iron Pans (2 ft x 2 ft. x 3 in. deep), \$
Mode.	1 One-half Gallon Measure, . . . \$
Modern.	1 No. 3 Counter Scale, . . . \$
Modest.	1 Sugar Trier, 24 in., . . . \$
Mogul.	1 Doz. 8 oz. Tin Cans, with covers, . . . \$
Mohair.	1 Pair Rubber Gloves, . . . \$

For names and addresses of parties using these machines see folios 3, 4, 5, and 6; paragraphs 1, 4, 5, 18, 19, and 20: U. S. Government, Universities, Railroad Companies, Cement Manufacturers, Engineers, and Contractors.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD CEMENT TESTING MACHINE.

600 LBS. CAPACITY, "STAR."

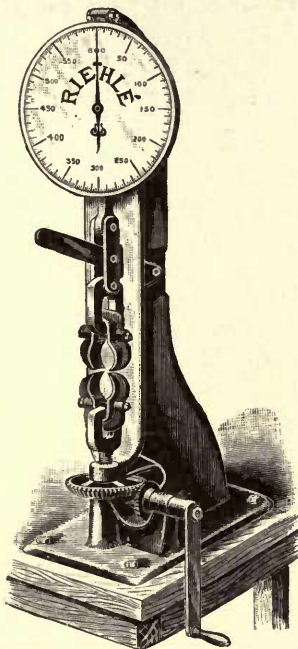


Plate No. 234.

## DIMENSIONS.

Extreme Height, . . . . .	38 in.
Extreme Length, . . . . .	16 in.
Extreme Width, . . . . .	15 in.
Weight, . . . . .	95 lbs.
Shipping Weight, . . . . .	115 lbs.

## ADAPTATION.

Tensile Specimen, . . . . .	1 in. area.
Motion of Screw, . . . . .	2 in.

### Telegraph.

Star: Price (all metal) with plain grips, as illustrated, . . . . .	\$
Starling: Price, with W. R. C. rubber pointed grips, . . . . .	\$

## DESCRIPTION AND OPERATION.

This machine was designed to meet the demand for a cheaper form of cement tester than our regular "standard," and one which would not occupy so much office room. Most of the room taken by this apparatus is in the vertical direction, and can therefore be easily spared.

The base is screwed fast to a table or shelf, sufficiently near the edge to allow the crank to turn. The specimens are then inserted in the grips, adjustment being made by the crank to suit the length of specimen, and when all is set fair and in readiness the pressure is applied smoothly and steadily by revolving the crank. The dial gauge has about  $1\frac{1}{2}$  inches of movement, and as it descends allows the wedge at the rear slide to drop and block the gauge and pointer from the shock of a sudden recoil at fracture, as well as leaving the register of the maximum load. The gauge is then relieved by means of the handle bar. A piece of pipe can also be used in connection with the bar for increase of power and ease of motion. The wedge is then withdrawn, and pointer allowed to return to zero. The dial gauge can be removed and tested for accuracy at any time. We believe this machine will prove very handy and convenient.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## THE FOLLOWING VARIETIES OF ADDITIONAL MOLDS AND REQUISITES CAN BE FURNISHED BY RIEHLÉ BROS. TESTING MACHINE CO. UPON APPLICATION:



Plate No. 241.

- Telegraph.*  
Magnify. Complete Nest No. 2, Cement Test Sieves (3 Sieves), \$  
Madeira. 6 in. diam., No. 50 Sieve, 2,500 Meshes to the square  
in., No. 35 Stubbs' Wire Gauge, . . . . . \$  
Madonna. 6½ in. diam., No. 74 Sieve, 5,476 Meshes to the  
square in., No. 37 Stubbs' Wire Gauge, . . . . . \$  
Magical. 7 in. diam., No. 100 Sieve, 10,000 Meshes to the  
square in., No. 40 Stubbs' Wire Gauge, . . . . . \$  
BRASS WIRE CLOTH AND BRASS FRAME.  
Brass Wire Cloth and Tin Frames furnished if ordered.



Plate No. 242.

- Telegraph.*  
Magnet. Complete Nest No. 1, Sand Test Sieves (2 Sieves), . . \$  
Mace. 7½ in. diam., No. 20 Sieve, 400 Meshes to the  
square in., No. 28 Stubbs' Wire Gauge, . . . . . \$  
Mackerel. 8 in. diam., No. 30 Sieve, 900 Meshes to the  
square inch, No. 31 Stubbs' Wire Gauge, . . . . . \$  
BRASS WIRE CLOTH AND BRASS FRAME.  
Brass Wire Cloth and Tin Frames furnished if ordered.



Plate No. 257.

- Telegraph.*  
Marvin. Brass Sieve, with lid and bottom (viz., this word,  
used with the Code of either size Sieve, will in-  
dicate that the Sieve is wanted with a lid and a  
bottom). If this word is used with the word  
"Magnet" or "Magnify," one lid and one bottom  
would be furnished to fit the largest Sieve of the  
Nest, . . . . . \$

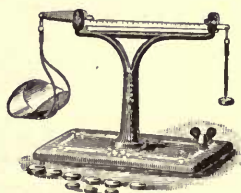


Plate No. 243.

- Telegraph.*  
Mist. Special Scale (to ascertain fineness of Cement), . . . \$



Plate No. 244.

- Telegraph.*  
Modern. No. 3 Counter Scale, . . . . . \$



Plate No. 245.

- Telegraph.*  
Mason. Mason Trowel, 8 in. (to mix Cement), . . . . . \$



Plate No. 246.

- Telegraph.*  
Measure. Pointing Trowel (to make Briquette in molds), . . \$

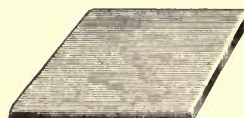


Plate No. 247.

- Telegraph.*  
Myrtle. Mixing Table, 24" x 24" of glass (ground), . . . \$  
Mixing. Mixing Table, 24" x 24" of Slate (Countersunk), . . \$  
Meredith. Mixing Table, 24" x 24" of Slate (Flat), . . . . . \$



Plate No. 249.

- Telegraph.*  
Model. Dozen Galvanized Iron Pans (24" x 24" x 3"  
deep), . . . . . \$  
Melrose. Galvanized Iron Pan (24" x 24" x 3" deep), . . . \$  
Meadow. Copper Pan (24" x 24" x 3" deep), . . . . . \$  
Maynard. Copper Pan (18" x 12" x 3" deep), . . . . . \$  
Mattson. Agate Seamless Pan (10" x 10" x 2½" deep), . . \$  
Mansion. Agate Seamless Pan (11" x 11" x 2½" deep), . . \$  
Marsden. Agate Seamless Pan (12" x 12" x 2½" deep), . . \$  
Marvine. Agate Seamless Pan (14" x 14" x 2½" deep), . . \$  
Marriott. Agate Seamless Pan (15" x 15" x 2½" deep), . . \$  
Margaret. Agate Seamless Pan (18" x 18" x 2½" deep), . . \$



Plate No. 250.

- Telegraph.*  
Mode. Half Gallon Measure (Tin), . . . . . \$  
Mechanic. Half Gallon Measure (Copper), . . . . . \$



Plate No. 252.

- Telegraph.*  
Modest. Cement Sampler (24 in.), . . . . . \$



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## ADDITIONAL MOLDS AND REQUISITES—Continued.



Plate No. 253.

*Telegraph*  
Mogul. Dozen 8 oz. Tin Cans, with covers, . . . . . \$  
Manship. 8 oz. Tin Can, with cover, . . . . . \$



Plate No. 254.

*Telegraph*,  
Mohair. Rubber Gloves (Plain), pair . . . . .



Plate No. 255.

*Telegraph*,  
Moquette. Pair Rubber Gloves, with gauntlets . . . . . \$



Plate No. 251.

*Telegraph*,  
Mister. 16 oz. Measuring Glass, . . . . . \$



Plate No. 174.

*Telegraph*,  
York. Cement Test Wires, in two sizes, light and heavy;  
light wire, 1-12 in. diam.,  $\frac{1}{4}$  lb. weight; heavy  
wire, 1-24 in. diam., 1 lb. weight; used for test-  
ing density, etc., of cement, per set. . . . . \$



Plate No. 256.

*Telegraph*.  
Mohican. Gang four Molds (Iron), "Engineers' Standard," . \$  
Manheim. Gang four Molds (Brass), . . . . . \$



Plate No. 265.

*Telegraph*.  
Noah. Mold, with Clip (old Fig. 3), "Engineers' Standard," \$



Plate No. 266.

*Telegraph*.  
Naomi. Mold, with Lever (old Fig. 4), "Engineers' Stand-  
ard," . . . . . \$  
Naudain, Mold, with two Levers (one at each end), . . . . . \$

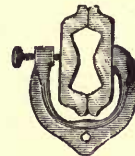


Plate No. 267.

*Telegraph*.  
Neville. Mold, with Clamp (this is furnished with all orders  
unless some other style is especially referred to,  
and is recommended as the best—(old Fig. 5),  
"Engineers' Standard," . . . . . \$



Plate No. 264.

*Telegraph*.  
Nineva. Mold, with Spring (old Fig. 2, "Engineers' Stand-  
ard," . . . . . \$



Plate No. 216.

*Telegraph*.  
Nicetown. 1 in. Cube furnished with Crush. Tool (old Fig. 6). \$



## W. R. C. RUBBER POINT CEMENT GRIP.

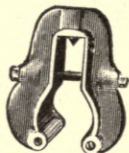


Plate No. 175.

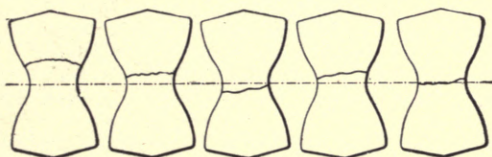
Telegraph.  
Cock. Price, . . . . . \$

### DESCRIPTION.

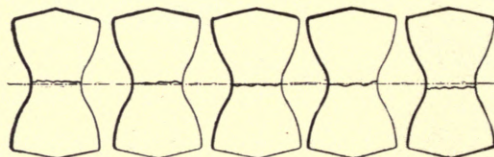
The Cement Grip above illustrated is a special form designed to prevent the Grip from cutting into the briquette, and causing it to break at other points than that of smallest area. The tendency of briquettes to break elsewhere than at the smallest point is well known, and various efforts have been made to overcome the annoyance, which has been proved by experiments to be chiefly due to imperfect centering of the briquettes in the Grips.

A series of experiments having proved that a cushion at the edge of Grips would prevent the breakage complained of, the W. R. C. Grip is placed on the market with the assurance that to a great extent it overcomes the difficulty, and gives a larger proportion of central fractures than any Grip heretofore used. The line of contact between Grip and briquette is a rubber tube mounted on a pin. This rubber tubing can be bought at slight expense, and can be readily replaced when worn out.

We illustrate below comparative results of breaking cement briquettes by a Standard and a W. R. C. Grip. Five briquettes were broken with the Standard, and five with the W. R. C.



BROKEN WITH STANDARD GRIP.



BROKEN WITH W. R. C. GRIP.

Cement was carefully sifted through a 50-mesh sieve, and the briquettes made at the Testing Laboratory of the Lawrence Cement Co., New York. The results shown clearly substantiate the claim that "imperfect fractures are due to the use of the old style Grip," and the perfect fractures to a Grip with protected edges. The central fractures made with the W. R. C. Grip are attributed to the fact that the yielding of the rubber allowed the briquettes to centre themselves perfectly.

The Grip is in use by a number of Engineers, and we append the following letter showing some results obtained from its use :

RIEHLÉ BROS. TESTING MACHINE CO.,

NEW YORK, January 2d, 1892.

GENTLEMEN :—

The "W. R. C." Grip has proved very satisfactory to us. During the last year we broke some 1,500 or more briquettes of a number of different brands of cement, both Portland and Rosendale. Over 95 per cent. of these broke within one-sixteenth of an inch of the smaller section, and not one broke more than one-quarter of an inch from the centre. The briquettes were all made and broken by a young man who had no previous experience in this kind of work.

We usually found that bad breaks were caused by some visible defect in the briquettes.

Yours very truly,

(Signed) WOLCOTT C. FOSTER.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD TWINE OR CLOTH TESTING MACHINE.

1,000 LBS. "SCHLICHTER."

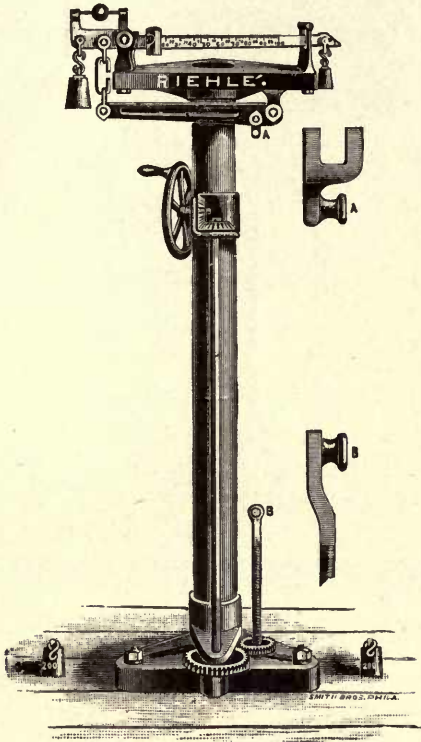


Plate No. 33.

DIMENSIONS.

Extreme Height, . . . . .	5 ft. 6 in.
Extreme Width, . . . . .	24 in.
Extreme Length, . . . . .	8 in.
Shipping Weight, . . . . .	about 100 lbs.

ADAPTATION.

Test Specimens, . . . . .	6 feet long.
Motion of Screw, . . . . .	8 inches.

Telegraph.			
Bailey.	CAPACITY, 500 lbs.	Price, . . . . .	\$
Schlichter.	Price, . . . . .		\$

The above illustration represents Riehlé Brothers' Improved Binder Twine Testing Machine. It is made in two sizes, viz.: 500 lbs. capacity and 1,000 lbs. capacity. Both machines test specimens in 6 feet lengths. The extreme height of the machine is 5 feet 6 inches; width, about 24 inches; depth, 8 inches. The motion of screw for taking up the slack of specimens is 8 inches. The apparatus stands upon the floor, and the beam comes in convenient reach of the experimenter, who can move the poise on same with one hand and turn the wheel that applies the strain with the other. In operating the machine the weighing of the test and the increasing of the power should be done simultaneously and the beam kept swinging entirely free, touching neither the upper nor lower bar. This Testing Machine is positively accurate and reliable, and so simple that there is no likelihood of its becoming deranged. The accuracy of the weighing levers can be tested at any time by suspending a known weight therefrom and moving the poise out to balance the same, and then observe that the weights agree. These levers are all regulated to the standard of the United States Government by weights sealed by the United States officials. Grips for holding cloth specimens, as shown on Plate No. 25, can be applied to this machine for testing long specimens of duck, etc., etc.

IN USE BY

WILMINGTON MILLS MANUFACTURING COMPANY, . . . . .	Wilmington.	SCHLICHTER MANUFACTURING COMPANY, . . . . .	Philadelphia.
JOHN T. BAILEY & Co., . . . . .	Philadelphia.	AND OTHERS. (See Folios 3, 4, 5, and 6, paragraph 18.)	



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ U. S. STANDARD CLOTH TESTING MACHINE.

500 LBS. "PITKIN."

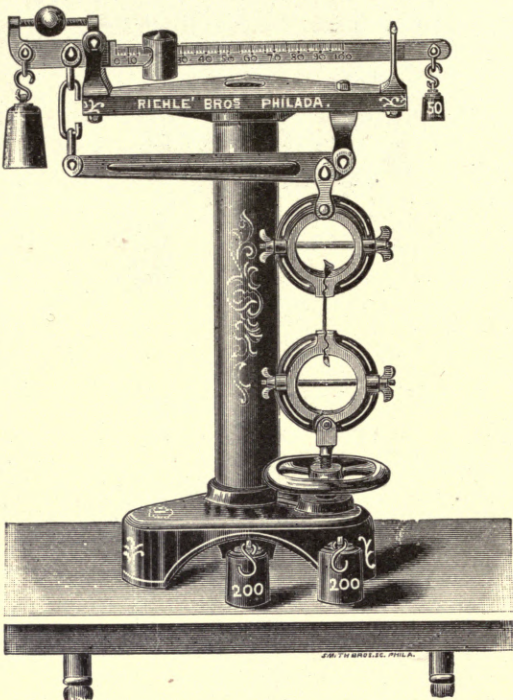


Plate No. 25.

DIMENSIONS.

Extreme Height, . . . . .	26 in.
Extreme Length, . . . . .	20 in.
Extreme Width, . . . . .	7 ½ in.
Weight, . . . . .	45 lbs.
Shipping Weight, . . . . .	65 lbs.

ADAPTATION.

Tensile Specimen, . . . . .	3 in. long by 1 in. wide.
Motion of Screw, . . . . .	1 ½ in.

Telegraph.

Pitkin. CAPACITY, 500 lbs., Price, . . . . . \$

This Cloth Tester can be arranged to take in longer test specimens up to 20 inches and more, if desired. at an additional cost. This will require the column to be lengthened and motion of screw to be increased.

DESCRIPTION.

This Cloth Tester is made entirely of iron, brass, and steel, and can rest on a table in an office. The power is applied by the hand-wheel and the strain weighed upon the beam.

IN USE BY

(See folios, 3, 4, 5, and 6; paragraph 18.)



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ U. S. STANDARD CLOTH TESTING MACHINE.

STYLE C.

200 LBS. "SCHUYLKILL."

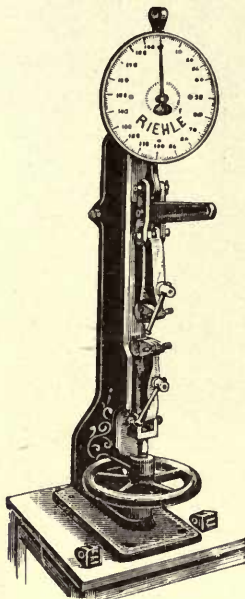


Plate No. 189.

### DIMENSIONS.

Extreme Height, . . . . .	3 ft.
Extreme Length, . . . . .	1 ft.
Extreme Width, . . . . .	8 in.
Weight, . . . . .	60 lbs.
Shipping Weight, . . . . .	75 lbs.

### ADAPTATION.

Tensile specimens of cloth 1 inch between grips by 1 inch wide; also  $\frac{1}{2}$  inch wide by extra set of grip jaws.  
This style of machine can be increased in height to test longer specimens, if ordered, at extra cost. It can also be used for testing cord or twine with suitable tools. Motion of screw 4 inches.

*Telegraph.*  
Schuylkill. Price, . . . . . \$

### DESCRIPTION AND OPERATION.

The above represents an accurate and reliable Cloth Tester, which is offered to the public as the best and handiest in the market.

It can be placed on a desk, is well finished and rather ornamental. By changing the grips it can be arranged to test paper, fine wire, silk, cotton, or twine.

After the specimen is in position, the hand-wheel shown at the bottom is turned from left to right, and as the strain increases the finger point on the dial indicates it. When the specimen breaks the pointer will remain at the highest point, as there is a wedge which follows the strain and locks the dial finger until released by the lever shown projecting conveniently in front.

The levers are adjusted to the standard of the United States Government.

### IN USE BY

UNITED STATES GOVERNMENT, . . . . . Schuylkill Arsenal, Philadelphia.

AND OTHERS.

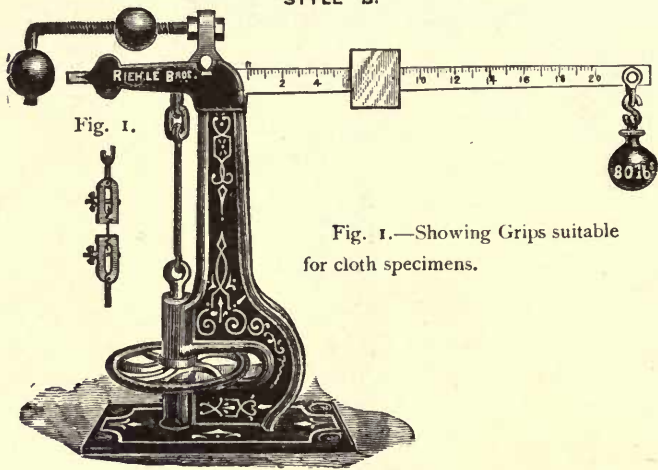
The RIEHLÉ U. S. STANDARD TESTING MACHINES were awarded the first premiums wherever exhibited: at the several exhibitions under the auspices of the Franklin Institute of Philadelphia, and of the Society of the American Institute of New York, also at the Expositions of the United States Centennial, 1876, and at the Exposition held at New Orleans.



# RIEHLÉ U. S. STANDARD TWINE OR CLOTH TESTING MACHINE.

100 LBS. "LEWIS."

STYLE B.



### DIMENSIONS.

Extreme Height, . . . . . 26 in.  
Extreme Length, . . . . . 25 in.  
Extreme Width, . . . . . 8 in.  
Weight, . . . . . 28 lbs.  
Shipping Weight, . . . . . 45 lbs.

Fig. 1.—Showing Grips suitable for cloth specimens.

### ADAPTATION.

Tensile specimen of cloth, 2 in. long, or less, and 1 in. wide.  
This style machine can be increased in height to test specimens 20 in. long, if ordered, and at extra cost.  
Motion of Screw, . . . . . 4 in.  
*Telegraph.*  
Lewis. Price, . . . . . \$

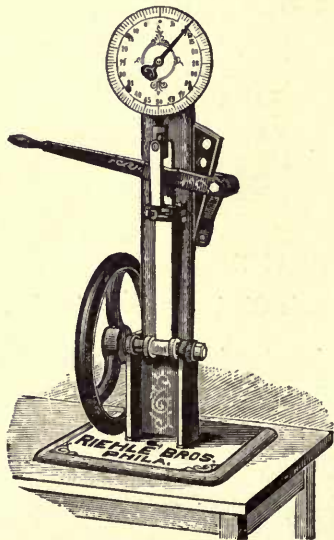
Plate No. 18.

### DESCRIPTION.

This machine is very simple in construction, and its application is very evident after a moment's observation. The left hand can move the wheel and the right hand operate the poise.

# RIEHLÉ U. S. STANDARD PAPER TESTER.

100 LBS. "WEYMOUTH."



### DIMENSIONS.

Extreme Height, . . . . . 2 ft.  
Extreme Length, . . . . . 1 ft.  
Extreme Width, . . . . . 1 ft.  
Weight, . . . . . 45 lbs.  
Shipping Weight, . . . . . 75 lbs.

### ADAPTATION.

Tensile Specimens, 12 in. long by 1 in. wide, or less.  
*Telegraph.*  
Weymouth. Price, . . . . . \$

Plate No. 20.

### DESCRIPTION AND OPERATION.

This Paper Tester is constructed entirely of metal. A weight balance indicates the strain. No loose weights. When the specimen is secured, the wheel at the end of the machine being turned, causes the mandrel to turn and apply the strain to specimens. The indicator on face of dial, remains stationary at the breaking point. A test can be made with speed and accuracy. The Weymouth Paper Mills, New Jersey, ordered the first machine. Every paper mill and paper dealer should have one.  
N. B.—A weighing beam can be substituted for a spring balance if desired.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ U. S. STANDARD TORSIONAL POWER TESTING MACHINE.

5,000 LBS. "POWER UNION."

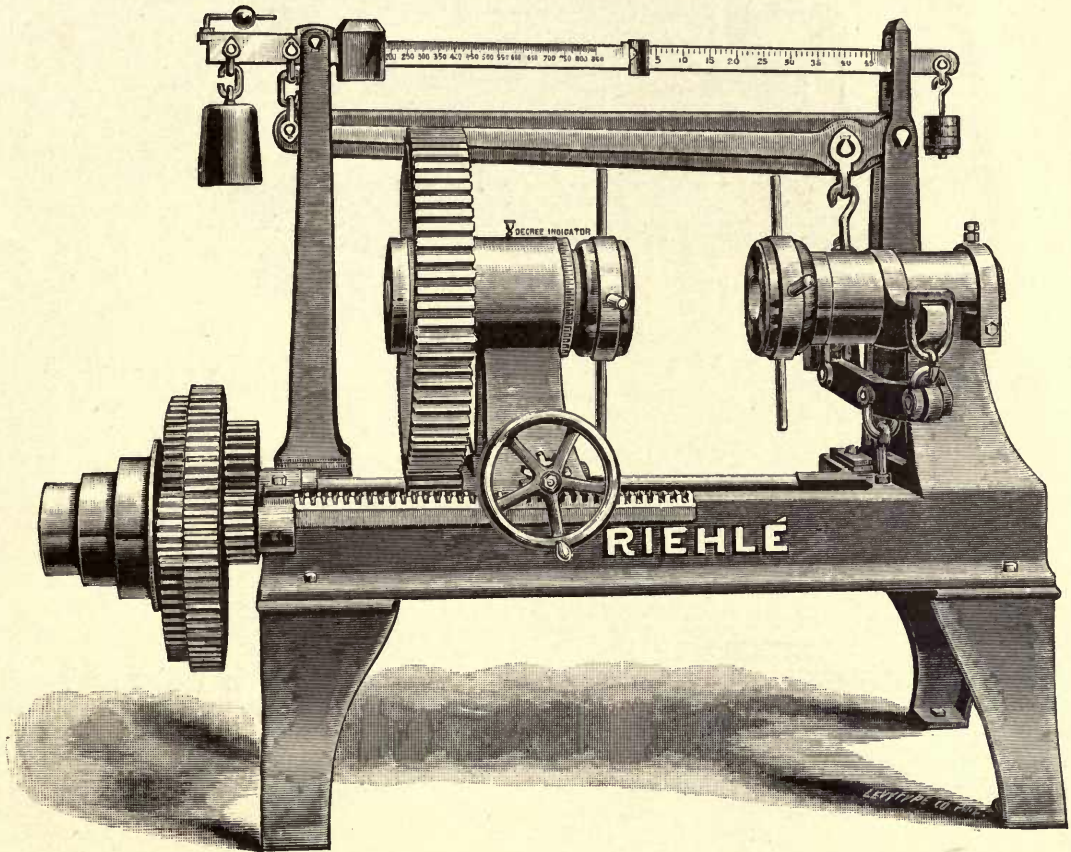


Plate No. 159.

## DIMENSIONS.

Extreme Height, . . . . .	3 ft. 10 in.
Extreme Length, . . . . .	6 ft. 4 in.
Extreme Width, . . . . .	3 ft.
Weight, . . . . .	2,100 lbs.
Shipping Weight, . . . . .	2,400 lbs.

Telegraph.

Power Union. Price, F. O. B. Philad'a (without Countershaft), . . . . . \$

## ADAPTATION.

Specimens can be 20 inches long or less. Specimens can be 1½ in. square or round, with square ends, or less. Motion of head 12 in. Capacity, . . . . . 5,000 lbs.

## DESCRIPTION.

This photograph illustrates the Riehlé New Iron Frame Torsional Testing Machine, which has met with favor beyond our expectation. It was first sold to a prominent railroad company for their Testing Department, and since it has been purchased by the Russian and Brazilian Governments, and several institutions of learning. The fixed head carrying Self-Centring Grips has arms one foot in length, projecting either side of the grip-head (which is supported on a knife edge). To prevent the grip-head from lifting from its position, the one-foot arms are connected to an equalizing lever underneath, and this in turn connects the weighing beams, where the strain is recorded in foot-pounds without any calculation on the part of the operator. The Cone Pulley has four sizes diameters, and is driven from the Countershaft which is furnished if ordered. Countershaft should not run faster than 30 or 40 revolutions.

This Machine is constructed entirely of iron, brass, and steel, and is of handsome design and finish. The levers and Weighing Beam are adjusted to the Standard of the U. S. Government at Washington. A modification of this design enables the power to be applied by hand instead of power, although if power is at hand it is much better to have the machine run by this method.

## IN USE BY

RUSSIAN GOVERNMENT, . . . . . St. Petersburg, Russia.  
WORCESTER UNIVERSITY, . . . . . Worcester, Mass.  
BRAZILIAN GOVERNMENT, . . . . . Rio Janeiro, Brazil.  
STATE COLLEGE OF PENNA., . . . . . State College, Pa.

UNIVERSITY OF CALIFORNIA, . . . . . Berkley, Cal.  
UNION PACIFIC RAILROAD, . . . . . Omaha, Neb.  
THOMSON-HOUSTON ELECTRIC Co., . . . . . Lynn, Mass.  
AND OTHERS. (See Folios 3, 4, 5, and 6.)



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## TORSIONAL WIRE TESTING MACHINE.

500 LBS. CAPACITY, "ANACONDA."

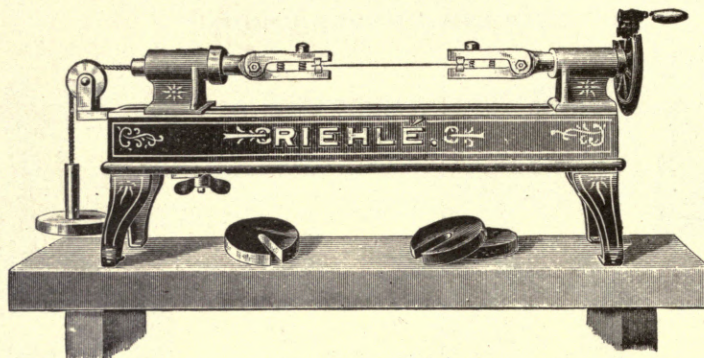


Plate No. 260.

### DIMENSIONS.

Extreme Length, . . . . .	42 $\frac{5}{8}$ in.
Extreme Width, . . . . .	7 $\frac{1}{2}$ in.
Extreme Height, . . . . .	16 $\frac{3}{4}$ in.
Weight, . . . . .	120 lbs.
Shipping Weight, . . . . .	150 lbs.

### ADAPTATION.

Shortest Length Specimen, . . . . .	2 in.
Longest Length Specimen, . . . . .	10 in.
Size of Specimen, . . . . .	$\frac{1}{4}$ in. round (or square) and less.
Capacity, . . . . .	500 lbs.

*Telegraph.*

Anaconda. Price (made entirely of metal), plain, as illustrated, . . . . . \$

### DESCRIPTION AND OPERATION.

This handy little machine is much used for testing telephone and telegraph wire by torsion strain. A test often required is 40 turns in a length of 6 inches, either for 80 mils or 104. Our machine has a sliding adjustable head to suit different lengths, with a tension take-up on the sliding spindle to allow for any change of length during test. There is also a blocking piece to lock the jaw out till wire is set. It is then removed, and gives free end play in both directions. The jaws being clamped on the wire the hand-wheel is then revolved and the turns counted.

### IN USE BY

ANACONDA COPPER AND MINING CO., . . . . . Anaconda, Montana.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ IMPROVED OIL TESTING MACHINE.

20,000 LBS. "GALBRAITH."

For Ascertaining the Relative Value of Lubricants, Giving the Co-efficient of Friction, and Pressure per Square Inch of Journal; Also, Temperature at Same Time.

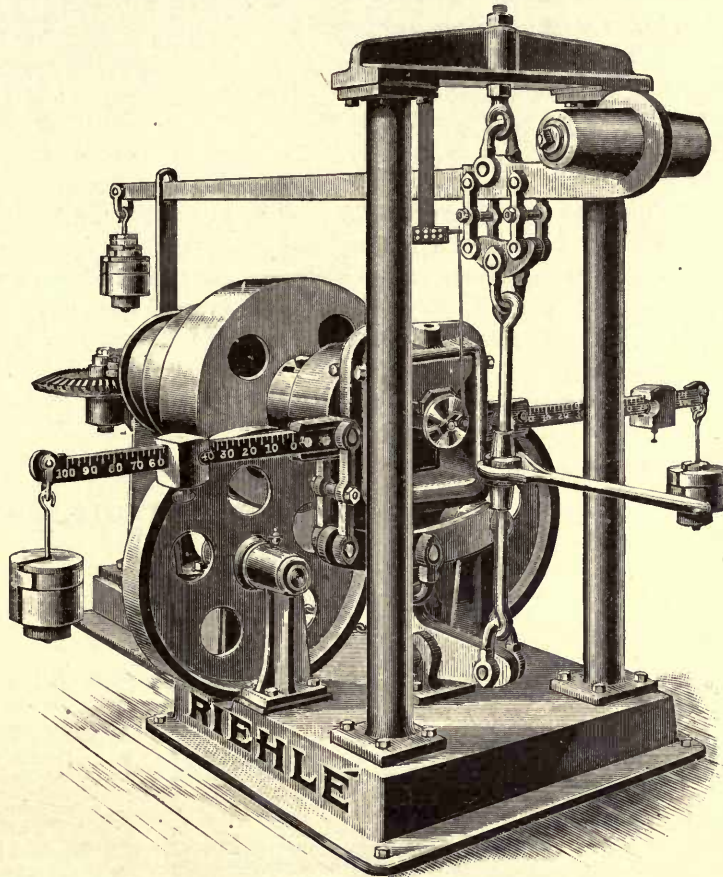


Plate No. 211.

## DIMENSIONS.

Extreme Length, . . . . .	7½ ft.
Extreme Height, . . . . .	6 ft.
Extreme Width, . . . . .	6½ ft.
Weight, . . . . .	6,250 lbs.
Shipping Weight, . . . . .	6,500 lbs.

*Telegraph.*

Galbraith. Price (with cone Pulley, including countershaft), . . . . . \$

## ADAPTATION.

Cone Pulley to be run at three different speeds.	
Diam. of Journal, . . . . .	3¾ in.
Length of Journal, . . . . .	7 in.

## DESCRIPTION AND OPERATION.

This compact Machine consists of a Master Car Builders' Axle Journal, which is removable from main spindle. This journal is made to revolve by Cone Pulley at different speeds, and in either direction, and can be loaded to different pressures per inch by means of the lever system. The oil can be applied through hole in top, which is tapped to receive Sight Feed Oiler, or funnel or other arrangement. There is also a hole for Thermometer to take temperature.

The Friction is weighed on the beams, which are arranged in double system to balance each other, and so Machine can be run in either direction. The opening in frame over journal is made large enough to take a regular car box if desired.

The Frame and Beams can be raised by rope sling and hoist for change of journal, cleaning up, etc., etc. There is an end motion of about ¼ to ¾ inch given to axle by the gearing shown at the end, giving a very natural movement, like cars. The weighted end of spindle runs loose on large rollers, to avoid friction and heating.

## IN USE BY

ST. PAUL & NORTHWESTERN RAILROAD CO., . . . . . St. Paul, Minn.  
SCHOOL OF PRACTICAL SCIENCE, . . . . . Toronto, Canada.





RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

TESTING DEPARTMENT,  
Ninth Street above Master, Philadelphia.


We would respectfully call the attention of all interested to the increased facilities offered at the Physical Testing Laboratory connected with our works, and established for over eighteen years. We are prepared to test all variety of materials by any form of test desired, and *claim to have one of the most complete Testing Laboratories in the United States.* A new testing machine is being built to test up to 300,000 pounds.


Tensile Specimens, . . . . .	10 in. up to 4 ft.
Transverse " . . . . .	12 " " 5 "
Compression " . . . . .	1 " " 3 " 6 in.

The specimens to be tested should be formed or prepared according to shapes illustrated herewith.  
For high-grade steel, specimens are tested of one-half in. sectional area=0.798 inches diameter.  
For low grade or softer steels and wrought iron, one inch area=1.127 inches diameter or less.  
For cast-iron and alloys and weaker materials, the same size as for wrought iron, etc.  
(Specimens can be tested with equal accuracy if they are of smaller diameter, if it is impossible to secure pieces large enough for one-inch sectional area.)  
Specimens for Government Test of Marine Boilers must be made to conform to shape as determined upon by Bureau of Supervising Inspectors of Steam Vessels. See Specimen No. 5.


Forms of Specimens for TENSILE TESTS.

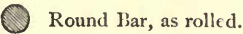
No. 1, . . . . .



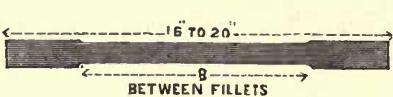


No. 2, . . . . .






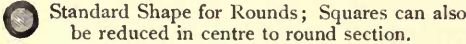
No. 3, . . . . .




Standard Shape for Flats or Squares. Edges must be smooth and true; Fillets, one-half inch radius; Specimens not over three inches wide.

No. 4, . . . . .






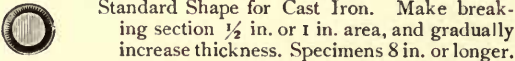
No. 5, . . . . .



Government Shape for Marine Boiler Plates only. Not in general use, given too high a test. Specimen No. 3 is recommended as the best form for ascertaining correct results.

No. 6, . . . . .







A.-CHAIN.

No. 7.—Any length from 18 in. to 4 ft., measuring inside of shackles. The outside measurement of shackles must be 3 in. x 4 in. or less, viz.: so as to go through a hole 3 in. x 4 in. large.



B.-WIRE ROPE.

No. 8.—Any length from 18 in. to 4 ft., measuring inside of loops. The outside measurement of end loops must be 3 in. x 4 in., viz.: so as to go through a hole 3 in. x 4 in. large.



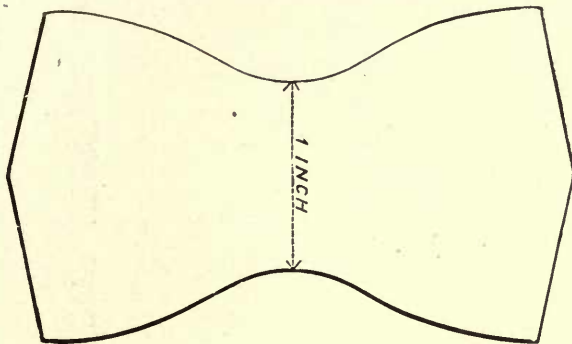
# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.



C.—HEMP ROPE.

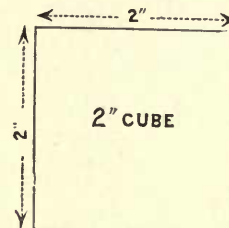
No. 9.—Any length from 18 in. to 4 ft., measuring inside of loops. The outside measurement of end loops must be 3 in. x 4 in. or less, viz.: so as to go through a hole 3 in. x 4 in. large.

## Form of Specimen of TENSILE STRAIN OF CEMENT AND ARTIFICIAL STONE, "ENGINEER STANDARD."



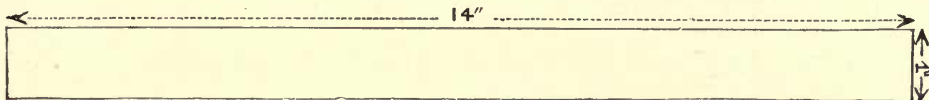
No. 10.—Full Size.

## Specimen of SLATE OR ARTIFICIAL STONE FOR COMPRESSION.



No. 11.—Or any smaller size or any length up to 4 ft.

## Form of Specimen for TRANSVERSE STRAIN OF IRON, STEEL, WOOD, ARTIFICIAL STONE, Etc.



No. 12.—Any length from 6 in. to 5 ft., or any height up to 4 ft.

## SCHEDULE OF PRICES. (Furnished upon Application.)

Test No.	Tests requiring 50,000 lb. Machine.	Tests requiring 120,000 lb. Machine.
1. Tensile Strain, plain test (no preparation of specimen), with one certificate, . . . .	\$	\$
3. Tensile Strain, with limit of elasticity and elongation, . . . . .	\$	\$
4. Tensile Strain, with limit of elasticity and elongation and per cent. of reduction, full report, . . . . .	\$	\$
5. Transverse Strain (plain test), . . . . .	\$	\$
6. Transverse Strain, full test, with record, . . . . .	\$	\$
7. Compression Test (plain test), . . . . .	\$	\$
8. Compression Test, full test, with record, . . . . .	\$	\$

Tensile Test of Leather, Rubber, and Canvas Belting; also all kinds of Fabrics.

Machine work preparing specimens will be charged at the rate of fifty cents per hour.

Prompt attention given to samples sent by express. Express charges should be prepaid.

Freight and cartage charged extra. Specimens are returned only when requested.

Unless specimens are prepared before they are sent to us, please send instructions, by referring to the shape, which form you prefer, and give the number of the test that you want made, and if you want more than one certificate. Extra certificates are charged for twenty-five cents each.

Special tests of all kinds (and of every variety of material), such as Indenting, Punching, Shearing, Abrasion, etc. We have made tests as follows for parties, viz.: *Stripping of Bolts and Nuts*; *Stripping of Coupling of Wrought-Iron Pipes*; *Shearing of Rivets in Boiler Plate*, with *punched* holes and *drilled* holes; the holding power of *Barbed Nails in Wood*; the compression resistance of *Spokes in Hubs*, etc., etc.

Also hydraulic testing, giving the bursting pressure of Wrought-Iron and Cast-Iron Pipe, Hose, etc., etc.

Riehlé Bros. Testing Machine Co. act as Inspectors and Arbitrators, and solicit correspondence from parties desiring *any variety of test to any kind of material*.

TESTING OF ALL KINDS OF MATERIAL MADE DAILY AT THE WORKS, NINTH ABOVE MASTER STREETS, AND CERTIFICATES FURNISHED. REPORTS COPIED AND KEPT CONFIDENTIAL.



*Philadelphia*, ..... 189

**RIEHLÉ BROS  
TESTING MACHINE CO.**

SUCCESSORS TO RIEHL & BROS.

PHILADELPHIA.

Dear Sir:

*We have this day tested for you.....strain, with the following result.*

[illegible]

*N. B.—Tests made daily. Samples stamped with their breaking weights, and returned ONLY when requested. Reports copied and kept confidential.*

*The Machines used are the Standard adopted by U. S. Government. Specimens must be sent to the works (Ninth St. above Master), and expressage be prepaid. State how much of the above information you require. List of charges and sizes of Specimens furnished on application.*

RIEHLÉ BROS. TESTING MACHINE CO.,

Per...



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ POWER HAY AND STRAW ROPE TWISTER.

"EXCELSIOR."

IN USE IN MOST OF THE LEADING CAST-IRON PIPE FOUNDRIES IN THE UNITED STATES.

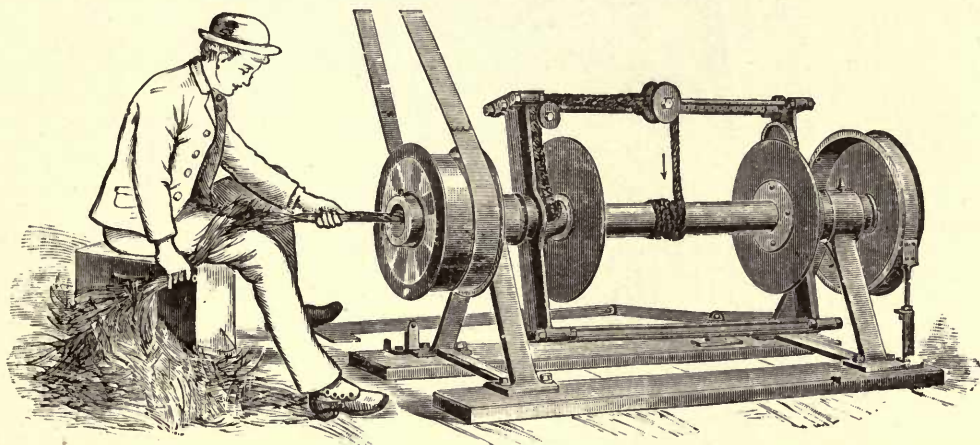


Plate No. 71.

## DIMENSIONS.

Extreme Length, . . . . .	6 ft.
Extreme Height, . . . . .	2 ft. 10 in.
Extreme Width, . . . . .	2 ft. 6 in.
Weight, . . . . .	750 lbs.
Shipping Weight, . . . . .	850 lbs.

## ADAPTATION.

Motion of Reel, . . . . .	Right to Left.
Capacity of Reel, . . . . .	about 1,000 feet of Rope.
Product, 5 to 10 Reels per day, according to size of Rope and skill of operator.	
Sizes of Rope, . . . . .	½ in. to 1 ½ in.

### Telegraph.

Excelsior. Machine complete with one reel (without countershaft), F. O. B., Phila., Price, . . . \$
Vault. Countershaft, extra, net, . . . . . \$
Scottdale. Extra reels, each, net, . . . . . \$

## DESCRIPTION,

This improved Hay and Straw Rope Twister or Spinner is superior to anything of the kind in the market. It is constructed of the most approved design, of the best materials, and the workmanship is first-class. The bearings of the revolving frame turn upon stout iron standards, which rest on heavy wooden skids, two inches by eight inches. The winding pulley is propelled backward and forward by cog gearing on a right and left screw, which reverses by a spring arrangement at each end of same. Now made with iron bottom frame supporting the upright iron frame.

## IN USE BY

H. R. WORTHINGTON, . . . . . New York.  
 OTIS BROS. & Co., . . . . . Yonkers, N. Y.  
 SAYRE PIPE FOUNDRY, . . . . . Sayre, Pa.  
 JACKSON & WOODIN MANUFACTURING CO., . . . . . Berwick, Pa.  
 NATIONAL PIPE FOUNDRY, . . . . . Scottdale, Pa.  
 DONALDSON IRON CO., . . . . . Emaus, Pa.  
 LAKE SHORE FOUNDRY, . . . . . Cleveland, Ohio.  
 NEW PHILADELPHIA PIPE WORKS, . . . . . New Philadelphia, Ohio.  
 THE OHIO PIPE COMPANY, . . . . . Columbus, Ohio.  
 DETROIT IRON FOUNDRY AND PIPE CO., . . . . . Detroit, Mich.  
 THE SCHICKLE, HARRISON & HOWARD CO., . . . . . St. Louis, Mo.  
 CINCINNATI AND NEWPORT PIPE WORKS, . . . . . Newport, Ky.  
 CHATTANOOGA PIPE WORKS, . . . . . Chattanooga, Tenn.

DENNIS LONG PIPE WORKS, . . . . . Louisville, Ky.  
 BIRMINGHAM IRON AND MACHINE WORKS, . . . . . Birmingham, Ala.  
 RUSK PENITENTIARY, W. G. PARRISH, . . . . . Rusk, Texas.  
 COLORADO COAL AND IRON CO., . . . . . Bessemer, Col.  
 ANNISTON PIPE WORKS, . . . . . Anniston, Ala.  
 VULCAN IRON WORKS, . . . . . Wilkes-Barre, Pa.  
 GLAMORGAN CO., . . . . . Lynchburg, Va.  
 MELLERT FOUNDRY AND MACHINE CO., . . . . . Reading, Pa.  
 SOUTH PITTSBURGH PIPE WORKS, . . . . . South Pittsburgh, Tenn.  
 R. HOE & Co., . . . . . New York, N. Y.  
 M. EWING, . . . . . Bay Side, N. J.  
 RADFORD PIPE AND FOUNDRY CO., . . . . . Radford, Va.

AND OTHERS.

The RIEHLÉ PATENTED HIGH FACE WEDGE GRIP is used in all their Testing Machines, and is absolutely necessary to secure a straight pull upon flat specimens.



## RIEHLÉ IMPROVED HAND SAND SIFTER.

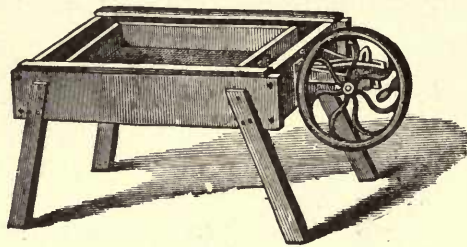


Plate 72.

### DIMENSIONS.

Extreme Length, . . . . .	4 ft. 9 in.	Height, . . . . .	2 ft. 5 in.
Breadth, . . . . .	2 ft.	Dimensions of Sieve, . . . . .	2 ft. 4 in. x 17 in.
Weight of Machine, . . . . .	125 lbs.	Motion, . . . . .	1 1/2 in.
<i>Telegraph.</i>			
Valley.	Price, including one Sieve. No. 6 Mesh, . . . . .		\$
Various.	Extra Sieves, each extra, Net, . . . . .		\$

### IN USE BY

TRENTON MALLEABLE IRON CO., . . . . .	Trenton, N. J.	COLBURN SPICE CO., . . . . .	Philadelphia, Pa.
OXFORD IRON AND NAIL CO., . . . . .	Oxford, N. J.	T. HAWLEY & CO., . . . . .	Bridgeport, Conn.
UNION FOUNDRY & MACHINE CO., . . . . .	Catasauqua, Pa.	CLIFTON IRON CO., . . . . .	Clifton, Ala.
J. A. EMERICK & CO., . . . . .	Philadelphia, Pa.	MILLER SCHOOL, . . . . .	Crozet, Va.
RIEHLÉ BROS. TESTING MACHINE CO., . . . . .	Philadelphia, Pa.	AND OTHERS.	

## RIEHLÉ POWER SAND SIFTER. FOR FOUNDRIES AND MANUFACTORIES.

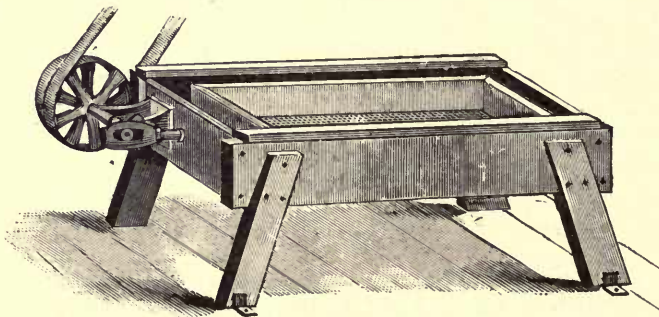


Plate 72 1-2.

### DIMENSIONS.

Extreme Length, . . . . .	7 ft.	Shipping Weight, . . . . .	225 lbs.
Extreme Width, . . . . .	2 ft. 8 in.	Dimensions of Sieve (inside measurement), . . . . .	4 ft. 5 in. x 1 ft. 5 in.
Extreme Height, . . . . .	2 ft. 5 in.	Motion, . . . . .	3 in.
Weight, . . . . .	160 lbs.		
<i>Telegraph.</i>			
Vatican.	Power Sifter, complete (without countershaft), with one Sieve, F. O. B., Philadelphia, . . . . .		\$
Variety.	Extra Sieves, each extra, Net, F. O. B., Phila., . . . . .		\$
Valeria.	Countershaft furnished when ordered, extra, Net, F. O. B., Phila., . . . . .		\$

### IN USE BY

MANNING, MAXWELL & MOORE, . . . . .	New York, N. Y.	J. A. EMERICK & CO., . . . . .	Philadelphia, Pa.
R. HOE & CO., . . . . .	New York, N. Y.	HAMILL & CORTRIGHT, . . . . .	Philadelphia, Pa.
W. WHARTON FISHER, . . . . .	Philadelphia, Pa.	BURNHAM, PARRY, WILLIAMS & CO., . . . . .	Philadelphia, Pa.
CROFT & ALLEN, . . . . .	Philadelphia, Pa.	PULLMAN CAR WHEEL CO., . . . . .	Chicago, Ill.
I. P. MORRIS CO., . . . . .	Philadelphia, Pa.	GLDENNING & CO., . . . . .	Quebec, Canada.
JOHN BAIRD & Sons, . . . . .	Philadelphia, Pa.	AND OTHERS.	

These Sifters are well and substantially made of the best material and superior workmanship. The illustrations above, together with the dimensions, etc., will plainly show the adaptability of the machine for various purposes: confectioners, spice-mills, dye-stuff manufacturers, etc.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

**"ATLAS" HYDRAULIC PRESS.**  
35 TONS CAPACITY.

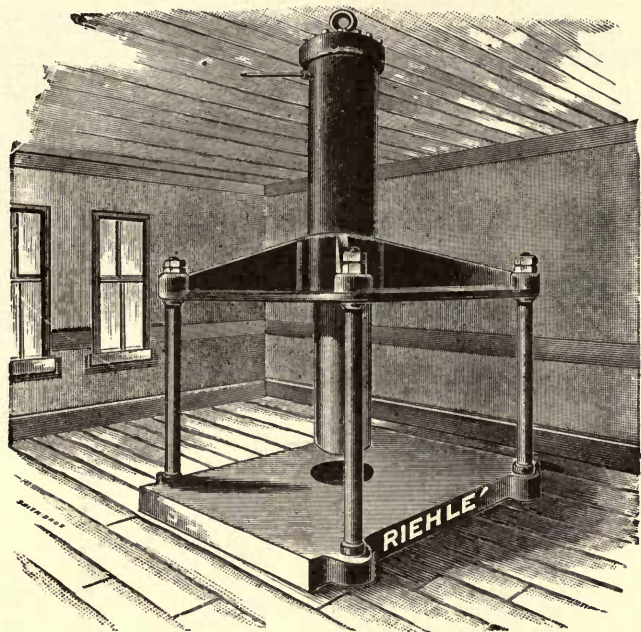


Plate No. 231.

*Telegraph.*

Atlas. (Including hydraulic pump), without countershaft. Price, . . . . . \$

**DIMENSIONS.**

Extreme height, . . . . .	10 ft.
Extreme width, . . . . .	4 ft. 9 in.
Extreme length, . . . . .	5 ft. 6 in.
Weight (including hydraulic pump), . . . . .	10,000 lbs.
Shipping weight (including hydraulic pump), . . . . .	10,500 lbs.

**ADAPTATION.**

Compression surface, . . . . .	10 in. diam.
Motion of plunger, . . . . .	4 ft.

**DESCRIPTION.**

This cut represents our thirty-five ton hydraulic press as used in a simple form by steel foundries for straightening or bending castings, and for a variety of uses as may be required.

The plunger is sustained by a counterweight which is generally made of scrap or ring weights by the parties purchasing the press. Power is then applied by means of a pump, or from the ordinary accumulator pressure to the upper part of the cylinder, and the plunger movement controlled by a three-way cock easily operated by a long lever.

We also have a somewhat similar pattern, but inverted, as used for oil presses, etc., and special sizes or kinds can be made to suit customers.

**IN USE BY**

STANDARD STEEL CASTING Co., . . . . .	Thurlow, Pa.
THOMSON-HOUSTON ELECTRIC Co., . . . . .	Lynn, Mass.



RIEHLÉ IMPROVED LOAM GRINDER.

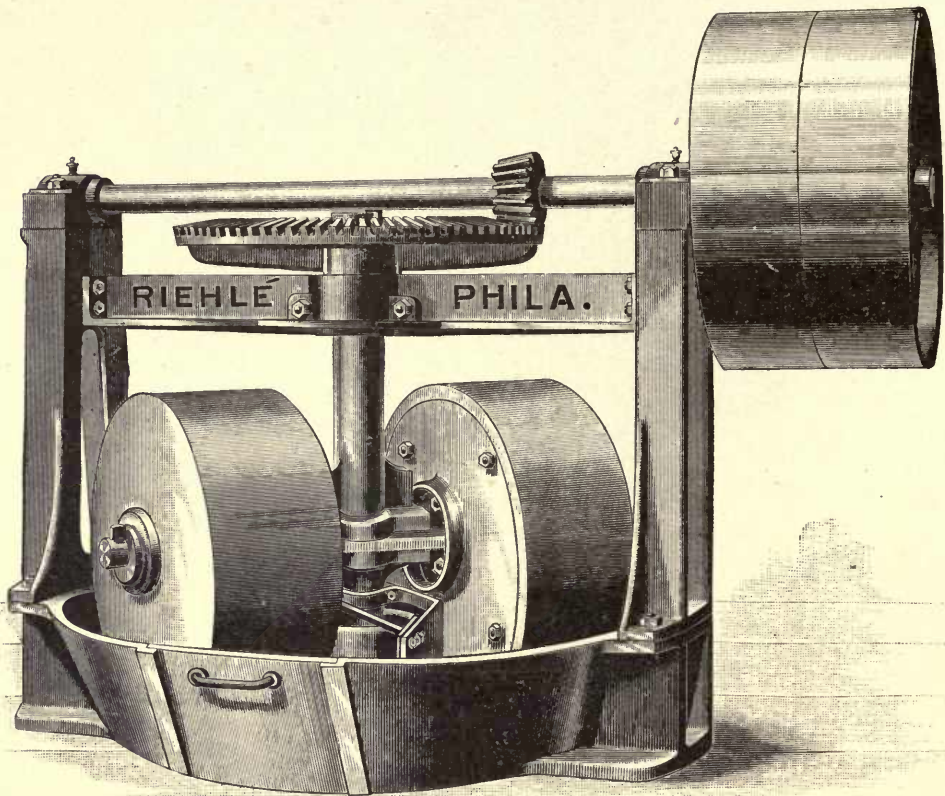


Plate No. 212.

DIMENSIONS.

Extreme Height, . . . . .	6 ft. 3 in.
Extreme Width, . . . . .	6 ft. 6 in.
Extreme Length (Including Pulleys), . . . . .	8 ft. 3 in.
Weight, . . . . .	9,000 lbs.
Shipping Weight, . . . . .	9,200 lbs.
Diameter of Pulleys, . . . . .	36 in.

Face of Pulleys, . . . . .	10 in.
Diameter of Rollers, . . . . .	33 in.
Face of Rollers, . . . . .	14 in.
Weight of Rollers, about 1,150 lbs. each, . . . . .	2,300 lbs.

ADAPTATION.

Revolution of Pulleys, . . . . .	72 to 80
Revolution of Main Upright Shaft, . . . . .	18 to 20

*Tel.*  
Irving. Price (without countershaft), . . . . . \$

DESCRIPTION AND OPERATION.

This Machine is very compact and substantial. It is also self-contained and requires no millwright work to put it up, as it is all iron. It is furnished with anti-friction ball-bearings, and is the most improved pattern in the market.

IN USE BY

UNION IRON WORKS, . . . . . San Francisco, Cal., AND OTHERS.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ'S SLAB TRUCK

FOR ROLLING MILLS.

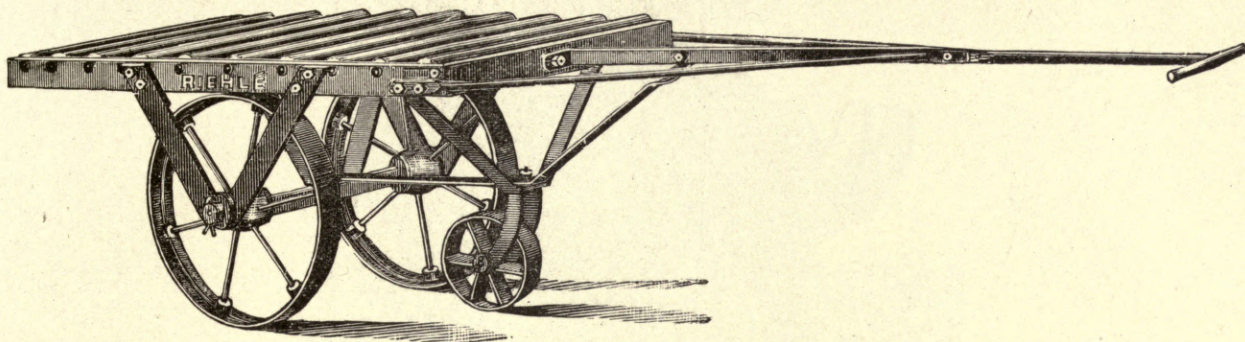


Plate No. 144.

*Telegraph.*

Carbon. Price, ..... \$

Extreme length, ..... 11 ft.  
 Extreme width, ..... 34 ft.  
 Extreme height, ..... 27½ ft.  
 Weight, ..... 600 lbs.  
 Size of platform, ..... 5 ft. x 2 ft. 6 ins.

Gauge of Wheel, ..... 22 ins.  
 Diameter of Wheel, ..... 24 ins.  
 Tread of Wheel, ..... 3 ins.  
 Size of Axle, ..... 1¾ ins.  
 Size of Hub, ..... 4 ins.

This truck was designed and constructed for the Carbon Iron Co., Pittsburgh, Pa., and we offer it with confidence to the rolling mill managers and superintendents. It is built in the most substantial manner, and well adapted to the rough use it will be subjected to. The wheels are furnished with friction rollers to give easy motion and light running service, and a swivel caster forms the guide or fifth wheel.



## RIEHLÉ STANDARD PIG METAL TRUCK AND TURN-TABLE.

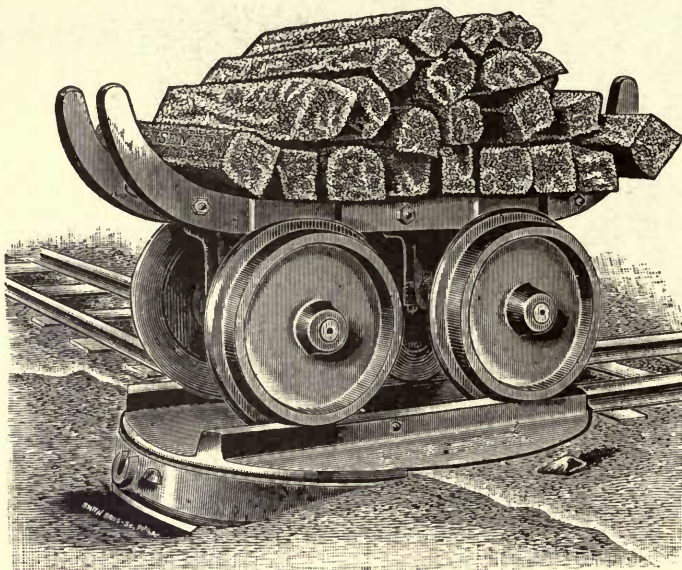


Plate No. 103.

### Size A.

Extreme Length, . . . . .	4 ft. 0 in.
Extreme height, . . . . .	2 ft. 3 in.
Extreme width, . . . . .	2 ft. 10 in.
Weight of truck, . . . . .	750 lbs.
Adapted for 24 in. gauge track. Wheels, 20 in. apart, from centre to centre. Can be made 6 in. narrower or 6 in. wider gauge of track.	
Wheels, 14 in. diameter, with 3 in. tread.	
Axles, 1 3/4 in. diameter.	

### Size B.

Extreme length, . . . . .	5 ft. 6 in.
Extreme height, . . . . .	2 ft. 3 in.
Extreme width, . . . . .	2 ft. 10 in.
Weight of truck, . . . . .	850 lbs.
Adapted for 24 in. gauge of track. Wheels, 28 in. apart from centre to centre. Can be made for 6 in. wider gauge of track, or 6 in. narrower.	
Wheels, 14 in. diameter, with 3 inch tread.	
Axles, 1 7/8 in. diameter.	

#### Telegraph.

Saxton. Price, size A, . . . . .	\$
Powell. Price, size B, . . . . .	\$

The "Riehlé Standard Pig Metal Truck" is made in two sizes as given above—one size to carry two tons; one size to carry three tons. They can be made larger or smaller if specially ordered, but these are the sizes which we generally receive orders for. The demands for heavy appliances around blast furnaces are fully met in the strength and weight in these trucks. They are built almost entirely of wrought iron, and we believe will last quite as long as the blast furnace itself. The axles are covered with gas pipe for self-oiling box, and the wheels are made with chilled tire.

These trucks have been tried long enough to test their merits conclusively, and give the greatest satisfaction wherever used.

#### IN USE BY

Grand Rivers Furnace Co., . . . . .	Grand Rivers, Ky., 24 Trucks.
Antrim Iron Co., . . . . .	Mancelona, Mich., 1 "
West Superior Iron and S. Co., . . . . .	W. Superior, Wis., 1 "
Powell Iron Co., . . . . .	Saxton, Pa., 1 "
N. Y. and Perry Coal & Iron Co., . . . . .	Shawnee, O., 1 "
New River Mineral & Iron Co., . . . . .	Ivanhoe, Va., 4 "

The "RIEHLÉ STANDARD TURN-TABLE" as illustrated above is made in two sizes. It is made very strong, substantial, and furnished with the track complete. The prices and dimensions as follows:

#### Telegraph.

Turn-Table A. Diameter, 3 ft. 6 in., 20-in. gauge of track (or can be 18 1/2-in. gauge), depth of track, 1 1/4 in., depth of turn-table (from bottom of track), 6 1/2 in., . . . . .	\$
Turn-Table B. Diameter, 3 ft. 8 in., 24-in. gauge of track, depth of track, 1 1/4 in., depth of turn-table (from bottom of track), 6 1/2 in., . . . . .	\$
Weight of turn-table A, 820 lbs. Weight of turn-table B, 850 lbs.	

#### IN USE BY

Grand Rivers Furnace Co., . . . . .	Grand Rivers, Ky., 4 Turn-Tables.
Jos. E. Thropp, . . . . .	Everett, Pa., 2 " "
New River Mineral and Iron Co., . . . . .	Ivanhoe, Va., 2 " "



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ NEW MARBLE MOLDING AND COUNTERSINKING MACHINE.

Sole owners and makers under Patents of September 14th, 1886, and May 17th, 1887.

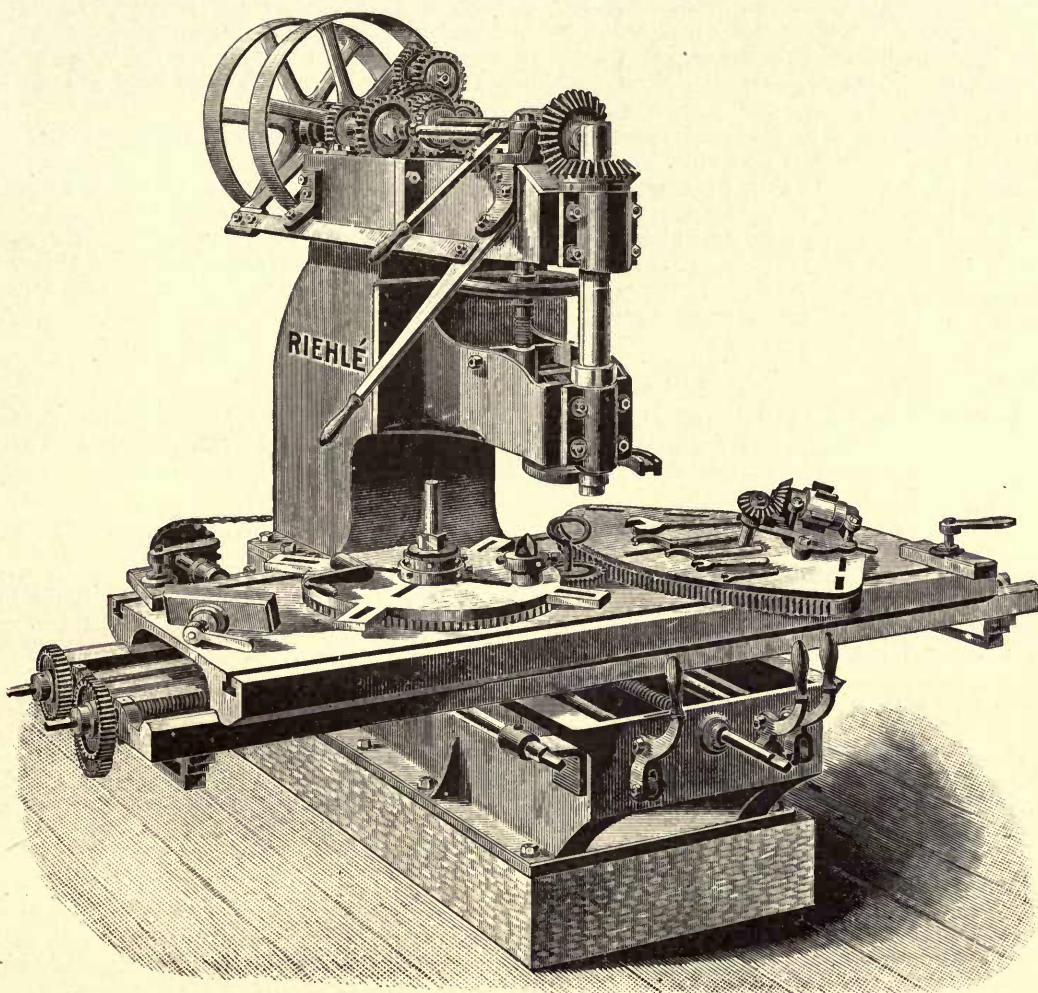


Plate No. 190.

### DESCRIPTION AND OPERATION.

The above engraving is from a photograph recently taken of the "RIEHLÉ PATENTED NEW MARBLE MOLDING AND COUNTERSINKING MACHINE," and embodies all the latest improvements. The machine is shown resting upon a block of stone, which is generally set upon a brick foundation. It is automatic in all its movements, and with the several appliances will perform a great variety of work on stone, such as molding, countersinking, etc. It is claimed that this machine will do the work of six or eight men in countersinking wash-stand slabs, besides leaving a much cleaner and smoother surface to polish.

The arrangement of slides is such that a cross-feed in either direction is obtained, and by an extra rotary table actuated by worm and gear, a rotary movement is added. This is used in beveling the hole of wash-stand tops.

By the three levers shown in front of machine, the different feed movements are thrown in and out of gear by the clutches which control them; and by skillful handling of the combinations a number of movements can be obtained, such as diagonal and spiral, in addition to the regular, long, cross, and rotary feed. The use of the crank permits of hand adjustment when power is off.

The upper bracket, carrying the driving shaft and gearing, is stationary, while the lower, carrying the cutter and spindle, is adjusted to the proper depth of cut by the hand-wheel and screw as shown.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

The two large pulleys on driving shaft are now driven by a sliding clutch operated between them, and as these pulleys are driven at speeds of about 75 and 120 revolutions respectively, we have the choice of these speeds according to circumstances.

This machine is compact, substantial, and well made, and will do all that is claimed for it. Twenty-eight slabs of Italian marble, 20"x30", are said to have been countersunk in ten hours, and it is claimed by some who have used this machine that 20 slabs can be maintained.

But comparatively little power is required to run this countersinking machine, as the revolutions of the cutters are slow. By using different cutters a variety of molding can be obtained, and the table, which moves, can be guided so as to cut in straight lines, circles, or any angle diagonally.

The table is made long enough to support the largest piece of marble that is likely to be required, such as hotel wash-basins with a number of holes. The operator has the machine under perfect control.

This machine has a double change of feed for cutters, by shifting a clutch on driving-shaft. It also embodies the convenient shifter lever, controlling two changes of driving-speed. The machines with long bed have an extra lever at end of table, making quadruple feed change and quick table return.

The Rotary and Corner Slab Tables have cut gear-teeth, and are driven from their outer periphery, giving them smoothness of running, which is very desirable.

The Pedestals of Surface Molder have been lengthened, so as to allow of cutting deeper moldings, up to about three-quarters of an inch deep. It is safe to commend this machine with the greatest confidence, as being the best appliance for accomplishing the purpose for which it is constructed. Notwithstanding the fact that the machine is fully protected by letters-patent in every detail, and that the material and workmanship are first-class, and that it has become a necessity, and actually indispensable, we have not taken advantage of our position in demanding what it is really worth to the purchaser, but are asking a very moderate price.

### 1st.—What the Plain Machine will do.

It will countersink the slabs and drop the faucet-stands (Figs. 1, 2, and 3), and mold the edge in O. G., bevel, or other shapes, the cutter working on a vertical axis. The feeds are either hand or automatic, at the will of the operator, and the tables move back or forth, from side to side, or in diagonal lines.

### 2d.—What the Rotary Table will do. (Shown in illustration to the left of centre.)

The Rotary Table feeds either by hand or automatically, at the will of the operator, and does its work in circles, spirals, and curves. By the combination of the feeds of the Rotary Tables with those of the lower tables, lines of any shape can be made. It is not necessary to remove the Rotary Table when straight lines are wanted, as by throwing out the Rotary Table feed, it works the same as a Plain Machine.

### 3d.—The Surface-Molder. (Shown in illustration on Quarter-Circle Table.)

The Surface Molder cuts from a horizontal axis, and is used for making panels, for laying out panels in plain slabs, for vestibule sides, wainscoting, etc. It will cut at any distance inside the slab (see Fig. 4). It is largely used for channeling or ploughing to simulate joints, or to hide joints for lintels and door or window-casings.

### 4th.—The Quarter-Circle Table. (Illustrated on Circular to the right of centre.)

The Quarter-Circle or Corner Slab Table is used for countersinking corner-basin slabs, and its feed is so arranged that travel per second is the same whether cutting close to the centre or to the outer edge.

The regular cutter-head furnished with the Machine has six steel knives, which are ground to suit the shape of molding required.

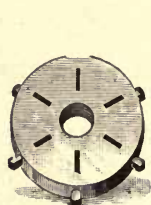


Plate  
No. 181.

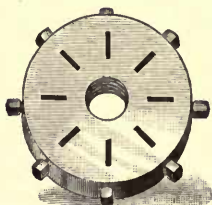


Plate  
No. 182.

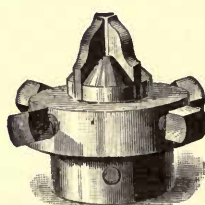


Plate  
No. 183.



Plate  
No. 184.



Plate  
No. 185.



Plate  
No. 186.



Plate  
No. 187.



Fig. 1.



Fig. 2.

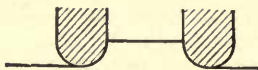


Fig. 3.



Fig. 4.



Fig. 5.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

Plate 181 represents the regular countersinking cutter-head furnished with the Machine. This head receives cutters of 3/4 inch by 1/4 inch, or 3/4 inch by 3/16 inch steel, held in place by set-screws; the thrust of the cut being received on the washer-plate behind.

This style of cutter-head is also made in a larger size with eight cutters and known as Plate 181, size B.

Plate 182 is a special cutter, and was made to order with the view of cutting very wide molding at one cut. It is like the regular countersinker.

Plate 183, known as RIEHLÉ-HATCHER CUTTER, patented December 3d, 1889 (of which we are the sole makers and owners), is very valuable for cutting side moldings, as it is very stiff and works the cutters very close to centre. It will also cut a groove or a bead, and it is said will turn out more moldings than any other style.

Plate (Cutters) 184 are used to cut bevels, as shown by Fig. 1.

Plate (Cutters) 185 are used to cut O. G.'s, as shown by Fig 2.

Plate (Cutters) 186 are plain countersinking cutters.

Plate (Cutters) 187 are used for countersinking and dropping faucet elevations, as shown by Fig. 3.

The Surface Molder cuts interior moldings, as shown by Fig. 4. Knives of different forms can be used as required.

The Riehlé-Hatcher Patent Cutter, Plate No. 183, is used to cut all kinds of moldings, and is the most serviceable of any for this purpose.

FURTHER DESCRIPTION OF RIEHLÉ'S MARBLE MOLDING AND COUNTERSINKING MACHINE.

DIMENSIONS.

	4-ft. Bed Machine.	6-ft. Bed Machine.	8-ft. Bed Machine.	10-ft. Bed Machine. Double Spindle.
Extreme Length, . . . . .	6 ft.	8 ft.	10 ft.	13 ft.
Extreme Width, . . . . .	6 ft.	6 ft.	6 ft.	9 ft.
Extreme Height, . . . . .	5 1/2 ft.	5 1/2 ft.	5 1/2 ft.	9 ft.
Table, . . . . .	{ 4 ft. long x by 2 ft. 5 in. wide. }	{ 6 ft. long x 2 ft. 5 in. wide. }	{ 8 ft. long x 2 ft. 5 in. wide. }	{ 10 ft. long x 2 ft. 10 in wide. }
Weight . . . . .	3,078 lbs.	3,700 lbs.	4,000 lbs.	9,000 lbs.

ADAPTATION.

Paneling, Countersinking, and Molding on inside or outside edges, and Faucet dropping.

Heads of different kinds are made as ordered for making special designs. These cannot be described, as the variety is infinite.—Vertical motion for Cutters, 6 inches.—Revolution of Cutters 70 and 120 per minute.

SELLING PRICES FOR MARBLE MACHINES.

TWO SPEEDS AND TWO FEEDS.

Telegraph.

Wyoming.	4-ft. Bed, Plain, . . . . .	\$
Seminole.	4-ft. Bed, Plain, with Rotary Table only, . . . . .	\$
Piedmont.	4-ft. Bed, Plain, with Surface Molder, only, . . . . .	\$
Cheyenne.	4-ft. Bed, Plain, with Surface Molder and Rotary Table, . . . . .	\$
Yellowstone.	4-ft. Bed, Plain, with Surface Molder, Rotary Table, and Quarter Circle, . . . . .	\$

THREE FEED-SPEEDS AND BELT DRIVEN.

Woodside.	6-ft. Bed, Plain Table only, . . . . .	\$
Winchester.	6-ft. Bed, Plain, with Rotary Table only, . . . . .	\$
Wayne.	6-ft. Bed, Plain, with Surface Molder only, . . . . .	\$
Waterford.	6 ft. Bed, Plain, with Surface Molder and Rotary Table, . . . . .	\$
Washington.	6-ft. Bed, Plain, with Surface Molder, Rotary Table, and Quarter Circle, . . . . .	\$

THREE FEED-SPEEDS, CHAIN DRIVEN, AND LEVER.

Warren.	8-ft. Bed, with Plain Table only, . . . . .	\$
Wakefield.	8-ft. Bed, with Rotary Table only, . . . . .	\$
Waumpum.	8-ft. Bed, with Surface Molder only, . . . . .	\$
Woodman.	8-ft. Bed, with Surface Molder and Rotary Table, . . . . .	\$
Wilton.	8 ft. Bed, with Surface Molder, Rotary Table, and Quarter Circle, . . . . .	\$
Wilmot.	Surface Molder, sent separate, not including fitting to machine, . . . . .	\$
Whitehall.	Corner Table, sent separate, not including hole drilled in other table, . . . . .	\$
Waunakee.	If chain feed is ordered for 6-ft. bed machine, add extra, . . . . .	\$

N. B.—We send a large and small cutter-head with each machine, and three sets of countersinking bits.

Extra cutter-heads furnished as ordered, at following prices:



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

### SPECIAL APPLIANCES FOR THE RIEHLÉ MARBLE MOLDING AND COUNTERSINKING MACHINE.

<i>Tel.</i>	<i>Plate No.</i>		
Defray.	181.	Cutter-head for countersinking (small),	Price, \$
Deflour.	181B.	Cutter-head for countersinking (large),	" \$
Defunct.	182.	Special adjustable cutter-head for faucet stands,	" \$
Degrade.	183.	Special cutter-head (H) for molding,	" \$
Deiform.	—.	Cutter-head for granite and hard stock (three wheel),	" \$
Delicate.	184 and 185.	Extra bits for chamfer, etc.,	" \$
Delay.	186.	Extra bits for countersinking,	" \$

<i>Tel.</i>	<i>Plate No.</i>		
Deluge.	187.	Extra bits for countersinking faucet tops,	Price, \$
Delirium.	—.	Emery wheel and stand complete with countershaft, for sharpening bits,	" \$
Delusive.	—.	Special emery wheels additional, extra, each,	" \$
SPECIAL STEEL for making bits, $\frac{3}{4}$ inches by $\frac{1}{16}$ inches. This is a very superior steel, and the only kind we can recommend, and as the size is very small, the price is very high, and a pound of steel will make, say twelve bits of ordinary length.			

The above articles will be procured by us and furnished to our customers in order to accommodate them. As all the articles are special, we will send them C. O. D. at the lowest possible price.

The *special* steel which we recommend for use for bits is cut hot, and must be kept from water while hot. It requires no working for cutters—merely cutting off and grinding edges. It is self-hardening, and if edges burn a little on emery wheel during sharpening, it does not hurt the steel or draw the temper.

### THE FOLLOWING PARTIES HAVE THESE MACHINES IN USE:

STANDARD MARBLE AND STONE CO., Loudon, Tenn.; one 4-ft. bed.  
 L. H. HERRON, Chicago, Ill.; one 6-ft. bed.  
 BATTERSON, SEE & EISELE, New York, N. Y.; two 4-ft., one 6-ft., one 8-ft., and one 10-ft. bed, double spindle.  
 EAST TENNESSEE STONE AND MARBLE CO., Knoxville, Tenn.; one 6-ft. bed.  
 BACHUS, BRISBIN & CO., Orizaba, Mexico; three 8-ft. beds.  
 BUSS & CO., New York; one 6-ft. bed.  
 BOWKER, TORREY & CO., Boston, Mass.; one 4-ft. and one 8-ft. bed.  
 A. D. PUFFER & SON, Boston, Mass.; one 4-ft. bed.  
 CHAS. G. HALL & CO., Boston, Mass.; one 4-ft. bed.  
 A. KLABER, New York; one 4-ft. bed.  
 R. GOULDSBURY & SON, New York, N. Y.; one 4-ft. bed.  
 H. C. & G. S. BAILIE, New York; one 4 ft. bed.  
 SCOTT & SMITH, Brooklyn, N. Y.; one 4 ft. bed.  
 SIMPSON SHEPPARD, Brooklyn, N. Y.; one 4 ft. bed and one 6-ft. bed.  
 LAUTZ & CO., Buffalo, N. Y.; one 4-ft. bed and one 8-ft. bed.  
 I. A. WILLIAMS & CO., Utica, N. Y.; one 4-ft. bed.  
 DANIEL L. CROSSCUP, Philadelphia; one 4-ft. bed.  
 J. F. MANNING & CO., Washington, D. C.; one 4-ft. bed.  
 YOUNG & VAN GUNDEN, Allegheny, Pa.; one 4-ft. bed.  
 BRUNNER & RENKEL, Cleveland, Ohio; one 4-ft. bed.  
 C. F. MEHLING & CO., Cleveland, Ohio; one 4-ft. bed.  
 THE BLUE RIDGE MARBLE CO., Nelson, Ga.; one 4-ft. bed.  
 DALY, SMITH & HILL, Chattanooga, Tenn.; one 4-ft. bed.  
 GRANT, VOSS & BREESE, Milwaukee, Wis.; one 4 ft. bed.

BAGLEY & NASON, Chicago, Ill.; one 4-ft. bed.  
 FEENEY & DEVANNY, New York; one 4-ft. bed.  
 M. KEATING, Chicago, Ill.; one 6-ft. bed.  
 J. T. JOHNSTONE, Brandon, Vt.; one 4-ft. bed.  
 R. FORSYTH, Montreal, Canada; one 4-ft. bed.  
 A. BEGGS & SON, Allegheny, Pa.; one 4-ft. bed.  
 J. DIMOND, New York, N. Y.; one 6-ft. bed.  
 ROBERT C. FISHER, New York; one 8-ft. bed and one double spindle machine.  
 INVO MARBLE CO., San Francisco, Cal.; one 6-ft. bed.  
 ELLIN, KITSON & CO., New York, N. Y.; one 8-ft. and one 6-ft. bed.  
 JAMES McDONOUGH, Cleveland, Ohio; one 6-ft. bed.  
 M. NAUGHTON, Chicago, Ill.; one 6-ft. bed.  
 NICHOLS & SHIPWAY, New York; one 4-ft. bed.  
 JOHN M. MUELLER, JR., Cincinnati, one 6 ft. bed.  
 DAVIDSON'S SONS MARBLE CO., New York; one 6-ft. bed.  
 KEYSTONE MARBLE CO., Chicago, Ill.; one 8-ft. bed.  
 NORCROSS & SONS, Cleveland, Ohio; one 8 ft. bed.  
 HILGARTNER & CO., Baltimore, Md.; one 4-ft. bed.  
 KEYSTONE MARBLE CO., Philadelphia; one 6-ft. bed.  
 BUCKEYE MARBLE AND FREESTONE CO., Cincinnati, Ohio; one 8-ft. bed and one 6-ft. bed.  
 FLINDALL & MALLY, Chicago, one 6-ft. bed.  
 S. KLABER & CO., Carlstadt, N. J., one 6-ft. bed.  
 DAVIDSON & SONS, Marble Co., Chicago, one 6-ft. bed.

### EXTRACTS FROM LETTERS RECEIVED IN 1892.

DAVIDSON'S SONS MARBLE CO., New York: "We consider your Marble Machine indispensable in a fully-equipped marble factory."

D. L. CROSSCUP & SON, Philadelphia: "Your Marble Molding Machine has always given us entire satisfaction."

ELLIN, KITSON & SONS, New York: "The two Marble Countersinking Machines are working very satisfactorily."

L. HILGARTNER & SONS, Baltimore, Md.: "Giving satisfaction, and we pronounce it a good thing."

BRANDON MFG. CO., Brandon, Vt.: "Very satisfactory, and has cost nothing for repairs."

H. G. & G. S. BAILIE, New York: "We would not know how to do without it."

J. F. MANNING, Washington, D. C.: "In use four years; entirely satisfactory; absolutely no expense for repairs."

THOUSAND ISLANDS GRANITE CO., Montreal: "Very satisfactory machine, and of great use in the factory."

FEENEY & DEVANNY, New York: "Has given invariable and perfect satisfaction."

BUSS & CO., New York: "The two Marble Machines have done good work, and all that was promised of them."

CHAS. E. HALL & CO., Boston, Mass.: "More than equals our expectations; an invaluable machine."

GRANT, BREESE & CO., Milwaukee, Wis.: "It never refused to do the work required of it in the most satisfactory manner."

KEYSTONE MARBLE CO., Phila.: "The two machines do all and more than you claim for them."

M. KEATING, Chicago: "'It will do everything but talk,' says one of our men."

JOHN M. MUELLER, JR., Cincinnati: "Could not now do without it, and heartily recommend it."

EAST TENNESSEE STONE AND MARBLE CO., Knoxville, Tenn.: "We are very much pleased with them."

UNION MARBLE WORKS, Cleveland, O.: "Gives entire satisfaction, and cheerfully commended."

ALEXANDER BEGGS & SON, Allegheny, Pa.: "Have worked your Marble Machine every day since we bought it, six years ago. Never cost a dollar for repairs, excepting we renewed the cutter-head once."

THE BUCKEYE MARBLE AND FREESTONE CO., Cincinnati, O.: "It does all you claim for it. We would not know how to get along without it."



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

# RIEHLÉ PATENTED EXTRA HEAVY DOUBLE-SPINDLE MARBLE MOLDING AND COUNTERSINKING MACHINE.

(IF YOU WANT TO PURCHASE, SEND FOR PHOTOGRAPH.)

## DIMENSIONS.

Extreme height, . . . . .	9 ft.
Extreme width, . . . . .	9 ft.
Extreme length, . . . . .	13 ft.
Weight, . . . . .	8,700 lbs.
Shipping weight, . . . . .	9,000 lbs.
Table, . . . . .	10 ft. long x 2 ft. 10 in. wide.

## ADAPTATION.

Paneling, countersinking, and molding on inside and outside edges and faucet dropping.  
Vertical motion of cutters, . . . . . 2 ft  
Revolution of cutters, . . . . . 75 and 100 revolutions  
Quickest horizontal motion of spindles, see table movement.  
Slowest horizontal motion, see table movement.  
Quickest movement of the table lengthwise, . . . . . 26 in. per min.  
Slowest movement of the table lengthwise, . . . . . 8 in. per min.  
Quickest movement of the table crosswise, . . . . . 14 in. per min.  
Slowest movement of the table crosswise, . . . . . 8 in. per min.  
Quickest movement of the table diagonally combines other speeds.  
Will take in a piece of marble or stone, 2 ft. thick and 3 ft. wide x 10 ft. long.

### Telegraph.

Defeat. Plain. Price, . . . . . \$  
Defend. With Rotary Table. Price, . . . . . \$

## EXTRA.

The lever handle *A*, just seen projecting from side of machine, controls a change of feed, and this lever, in conjunction with the quick return lever *B*, at the end of the long table, and the shifter handle *C*, gives a series of eight changes of the rate of feed, varying from 3 feet per minute to 8 inches per minute.

### Telegraph.

Definite. With this appliance. Price, . . . . . \$

## DESCRIPTION.

The back pulleys are 22 inches diameter by 6 inches face, belted direct to the main line of shafting (this depends on line speed). The pulleys on the machine must run from left to right, and at a speed of about 70 to 120 revolutions, and so as to revolve cutters right-handed. Both pulleys are belted to separate pulleys on the main shaft, and are of equal diameter and face, and should be driven by a double belt 6 inches wide.

This machine is one of the largest marble molding and countersinking machines ever built, and known as "Style C."

It is automatic in all its movements, can be quickly adjusted and easily controlled, and will perform the work of several men in working upon marble, and leaves a much cleaner and smoother surface for polishing.

By using the three levers shown in the front of the machine, the several movements are thrown in and out of gear by clutches which control them, and by the combination of same other motions can be obtained, such as diagonal, in addition to the regular long and cross feeds. The rotary table is not included as regular, and must be ordered and paid for extra. The use of a crank permits of hand adjustments when the power is off.

The brackets carrying the driving shafts and gearing are stationary, while the cutters and spindles are adjusted to the proper depth of cut by the hand-wheel for rapid work and the worm for fine adjustment, as shown.

By using different cutters a variety of moldings can be obtained, and the table which moves can be guided so as to cut in a straight line, circles, or any angle diagonally.

We can recommend this machine with the greatest confidence as being suitable for the purposes for which it is constructed. It is fully protected by letters patent, of which our firm has exclusive control, and we are the sole makers. It has been put upon the market at a very moderate price, notwithstanding it is made in the most substantial form and of the very best material and by skilled workmen.

The first machine was built on special order for Messrs. Batterson, See & Eisele, New York, and is the fifth machine that this firm has purchased from us.

By the use of the double spindle one cutter-head follows the other, and in this way can remove extra stock and make wide moldings at one travel of the table.

## IN USE BY

BATTERSON, SEE & EISELE, . . . . . New York.  
BACKUS, BRISHIN & CO., . . . . . Orizaba, Mexico.  
ROBERT C. FISHER & CO., . . . . . New York, N. Y.



RIEHLÉ PATENTED EXTRA HEAVY DOUBLE-SPINDLE MARBLE MOLDING AND COUNTERSINKING MACHINE.

(IF YOU WANT TO PURCHASE, SEND FOR PHOTOGRAPH.)

DIMENSIONS.

Extreme height, . . . . .	9 ft.
Extreme width, . . . . .	9 ft.
Extreme length, . . . . .	13 ft.
Weight, . . . . .	8,700 lbs.
Shipping weight, . . . . .	9,000 lbs.
Table, . . . . .	10 ft. long x 2 ft. 10 in. wide.

ADAPTATION.

Paneling, countersinking, and molding on inside and outside edges, and faucet dropping.	
Vertical motion of cutters, . . . . .	2 ft.
Revolution of cutters, . . . . .	75 and 100 revolutions.
Quickest horizontal motion of spindles, see table movement.	
Slowest horizontal motion, see table movement.	
Quickest movement of the table lengthwise, . . . . .	26 in. per min.
Slowest movement of the table lengthwise, . . . . .	8 in. per min.
Quickest movement of the table crosswise, . . . . .	14 in. per min.
Slowest movement of the table crosswise, . . . . .	8 in. per min.
Quickest movement of the table diagonally combines other speeds.	
Will take in a piece of marble or stone, 2 ft. thick and 3 ft. wide x 10 ft. long.	

Telegraph.

Defeat. Plain. Price, . . . . .	\$
Defend. With Rotary Table. Price, . . . . .	\$

EXTRA.

The lever handle A, just seen projecting from side of machine, controls a change of feed, and this lever, in conjunction with the quick return lever B, at the end of the long table, and the shifter handle C, gives a series of eight changes of the rate of feed, varying from 3 feet per minute to 8 inches per minute.

Telegraph.

Definite. With this appliance. Price, . . . . .	\$
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DESCRIPTION.

The back pulleys are 22 inches diameter by 6 inches face, belted direct to the main line of shafting (this depends on line speed). The pulleys on the machine must run from left to right, and at a speed of about 70 to 120 revolutions, and so as to revolve cutters right-handed. Both pulleys are belted to separate pulleys on the main shaft, and are of equal diameter and face, and should be driven by a double belt 6 inches wide.

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The brackets carrying the driving shafts and gearing are stationary, while the cutters and spindles are adjusted to the proper depth of cut by the hand-wheel for rapid work and the worm for fine adjustment, as shown.

By using different cutters a variety of moldings can be obtained, and the table which moves can be guided so as to cut in a straight line, circles, or any angle diagonally.

We can recommend this machine with the greatest confidence as being suitable for the purposes for which it is constructed. It is fully protected by letters patent, of which our firm has exclusive control, and we are the sole makers. It has been put upon the market at a very moderate price, notwithstanding it is made in the most substantial form and of the very best material and by skilled workmen.

The first machine was built on special order for Messrs. Batterson, See & Eisele, New York, and is the fifth machine that this firm has purchased from us.

By the use of the double spindle one cutter-head follows the other, and in this way can remove extra stock and make wide moldings at one travel of the table.

IN USE BY

BATTERSON, SEE & EISELE, . . . . .	New York.
BACKUS, BRISBIN & Co., . . . . .	Orizaba, Mexico.
ROBERT FISHER, . . . . .	New York, N. Y.



RIEHLÉ MARBLE BASIN HOLE CUTTER.

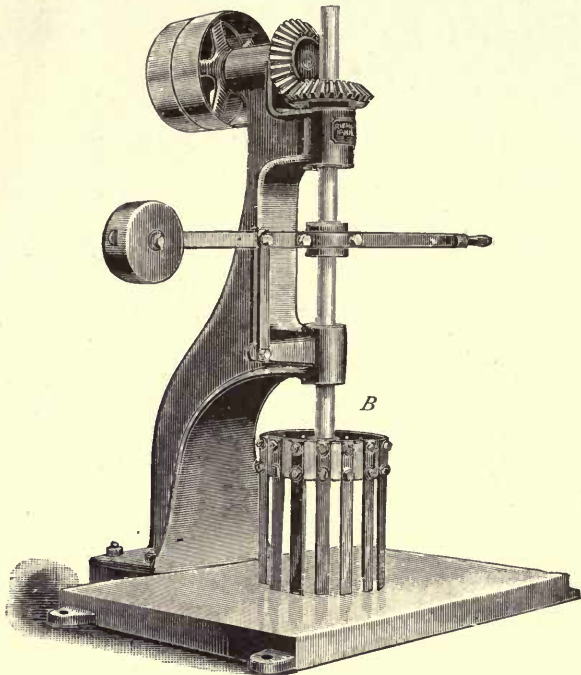


Plate No. 158.

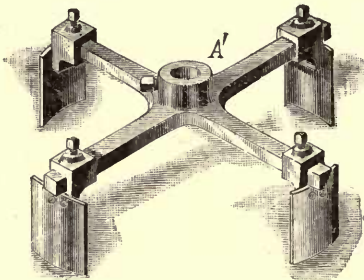


Plate No. 162.

A shows an adjustable Cutter-head that will cut holes from 8 inches in diameter to 12 inches. If different size Cutters are to be used they can be secured to the Shank at B.

THIS APPARATUS IS ARRANGED TO PLACE ON FRAMEWORK FURNISHED BY THE PURCHASER.  
IF NECESSARY, A TABLE CAN BE MADE FOR THE SLABS AND THE  
MACHINE SECURED TO THE TABLE.

DIMENSIONS.

Extreme height, . . . . .	4 ft.	Weight, . . . . .	530 lbs.
Extreme length, . . . . .	3½ ft.	Shipping weight, . . . . .	565 lbs.
Extreme width, . . . . .	2½ ft.	Tight and loose pulleys. No countershaft unless ordered.	

Telegraph.	
Deduct.	We can furnish these machines, plain. Price, . . . . . \$
Deepen.	With countershaft. Price, . . . . . \$
Default.	Mounted on table, with countershaft. Price, . . . . . \$
Detour.	B Cutter, 11½ in. diam. hole. Price, . . . . . \$
Deplete.	A " 12 " to 8 in. diam. Price, . . . . . \$
	Cutters can be ordered separate from machine.

DESCRIPTION AND ADAPTATION.

The machine consists of a vertical spindle with a motion of 10 inches, and driven by a horizontal driving-shaft connected with it by bevel gearing. This shaft carries tight and loose pulleys. The spindle is raised and lowered by a counterweighted lever with direct connection. The regular hole-cutter consists of a pulley 11½ inches diameter, furnished with a large number of cutters, 1 inch by ½ inch iron, secured to the rim. Cutters for any other size hole furnished. One cutter-head goes with every machine. Other cutters are extra.

If an adjusted cutter-bar is wanted it can be made with slots in a bar arranged to cut holes, say from 8 inches to 20 inches, but this will not cut as fast on account of not having as many cutters.

IN USE BY

THE TENNESSEE MARBLE & STONE Co., . . . . . Chattanooga, Tenn.  
D. CROSSCUP & SONS, . . . . . Philadelphia.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ POST BASIN HOLE CUTTER.

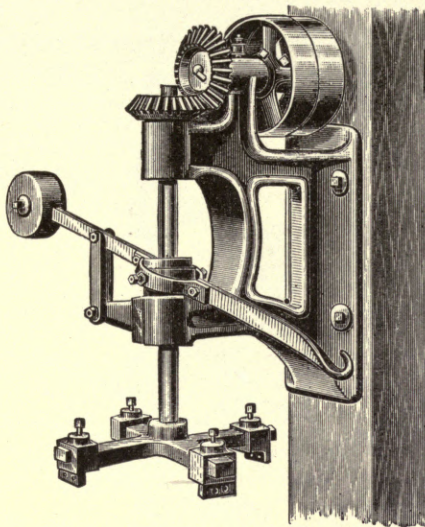


Plate No. 263.

### DIMENSIONS.

Extreme Length, . . . . .	2 ft. 2 in.
Extreme Height, . . . . .	2 ft. 10 in.
Extreme Width, . . . . .	3 ft. 6 in.
Weight, . . . . .	300 lbs.
Shipping Weight, . . . . .	350 lbs.

### ADAPTATION.

Cutter will cut basin hole, . . . . .	14 in. diam. and less.
Motion of Shank, . . . . .	6 in.

#### Telegraph.

Pontus.	Complete without countershaft, and without weight for lever.	Price, . . . . .	\$
Deepen.	Countershaft for same, . . . . .		\$

### DESCRIPTION AND OPERATION.

This machine is similar in its working to the basin hole cutter with stand and iron table, as shown in cut No. 158, the only difference being that this is arranged to attach to a post, and any kind of a table or platform can be set underneath to hold the slabs. It is very handy and compact.

#### USED BY

L. HILGARTNER & SON, . . . . . Baltimore, Md.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ IMPROVED MARBLE SANDING MACHINE.

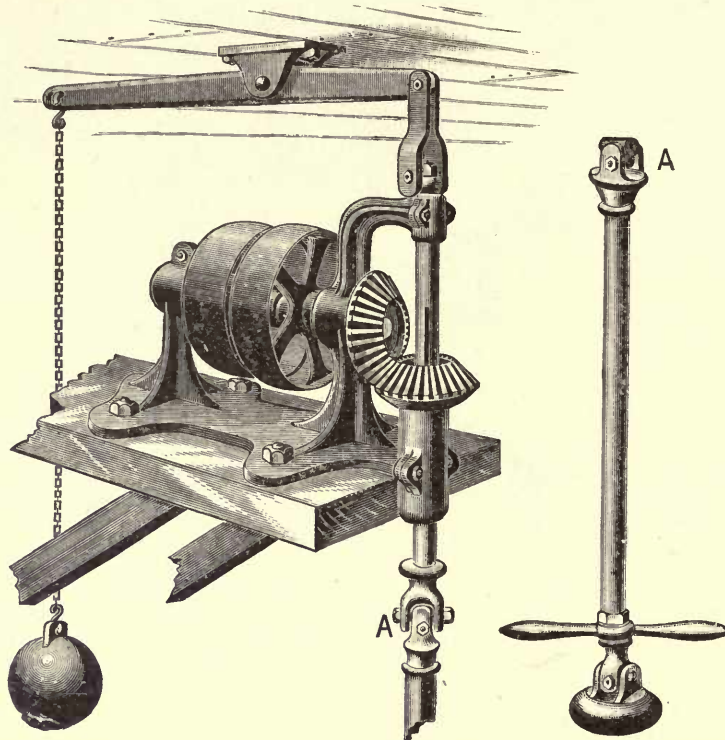


Plate No. 180.

### DIMENSIONS.

Extreme height, . . . . . 30 ins.  
 Extreme width, . . . . . 8 "  
 Extreme length, . . . . . 20 "

Weight, . . . . . 125 lbs  
 Shipping weight, . . . . . 200 "

*Tel.*  
 Polisher. Price (now made without balance-ball), . . . . . \$

### DESCRIPTION.

The accompanying illustration is a representation of our Marble Sanding Machine, which has proved to be a very useful and handy apparatus, and a valuable accompaniment to our Marble Countersinker and Molder. It consists of a disk, hollow in the centre, to retain the grit, etc., and revolved by means of the rods, gearing, and pulleys, as shown. Double flexible joints give a universal movement to the polishing-disk, which is guided by the handles, as shown. This apparatus has been well tried, and is known to be good.

As it is necessary to apply some weight in polishing marble and other stone, we now do away with the counter-balance, so as to utilize the weight of the shaft, etc., otherwise the operator will have to bear down on the head all the time he is working. Some of our customers who are using our Polisher removed the ball themselves, and gave us this suggestion.

### ADAPTATION.

The shaft slides up and down in its bearings, as shown in the cut, the spline in the shaft indicating where the key takes hold in revolving from the gear. This is the accommodation while running over a slab. For slabs, etc., of different thicknesses the rod is made telescopic, so as to be adjusted to a wide range of thicknesses, and when clamped in proper place it has the range due to the vertical movement of the driving-shaft in the gear. The cut shows the shaft at the extreme bottom of its stroke, and can be given more or less stroke, according to the length of shaft above A.

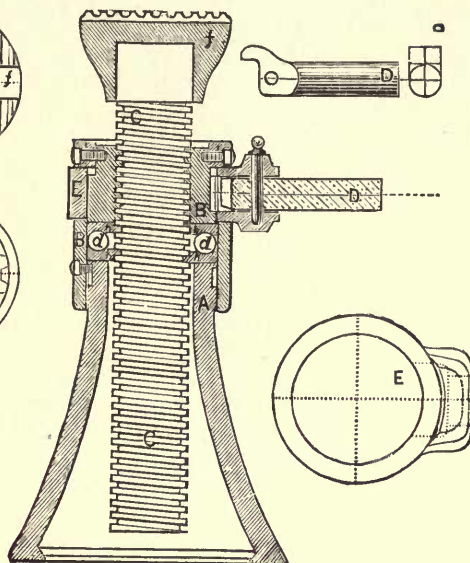
### IN USE BY

ELLIN, KITSON & Co., New York, . . . . . 3 Polishers.  
 KEYSTONE MARBLE WORKS, Philadelphia, . . . . . 1 Polisher.  
 BOWKER, TORREY, & Co., Boston, Mass., . . . . . 1 "

LAUTZ & Co., Buffalo, N. Y., . . . . . 1 Polisher.  
 BRUNNER & RENKEL, Cleveland, O., . . . . . 1 "  
 CHATTANOOGA MARBLE AND STONE Co., Chattanooga,  
 Tenn., . . . . . 1 "



## RIEHLÉ-ROBIE PATENT SCREW JACK.



Ruth.	5 tons,	4½ in. lift,	1¼ in. diam. screw,	8½ in. high,	5 in. diam. base,	weight,	18 lbs.,	...	\$
McConaughy.	5 "	7 "	1¾ "	"	11 "	5 "	"	25 "	\$
Augustus.	10 "	8 "	2 "	"	14 "	7 "	"	40 "	\$
Weaver.	10 "	8 "	2 "	"	18 "	7½ "	"	58 "	\$
Angelus.	10 "	18 "	2 "	"	24 "	8½ "	"	90 "	\$
Clark.	20 "	10 "	2½ "	"	19 "	8 in. square	"	85 "	\$
Bonsall.	20 "	18 "	2½ "	"	25 "	10 in. diam.	"	110 "	\$
Browning.	20 "	18 "	2½ "	"	29½ "	10 "	"	120 "	\$
Baker.	20 "	24 "	2½ "	"	32 "	8 "	"	130 "	\$
Furman.	30 "	10 "	3 "	"	20 "	10 "	"	130 "	\$
Binns.	30 "	24 "	3 "	"	30 "	12 "	"	200 "	\$



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Illustrations of Standard Sizes of Riehlé-Robie Ball-Bearing Screw Jacks.

Some makers of Jacks introduce a few under certain names, and after the name is known offer articles under the same name made in an inferior manner, and at a lower price. BEAR THIS IN MIND. "RIEHLÉ-ROBIE JACK" means a Jack with Frictionless Ball Bearings. Don't forget to ask the question when a Jack is offered for sale, "Has the Jack 'FRICTIONLESS BALL BEARINGS?'" All other Jacks are "AWAY BEHIND THE TIMES."

The RIEHLÉ-ROBIE JACKS are selling freely, and the list of users daily increasing. It is the only Jack adopted by the UNITED STATES GOVERNMENT also indorsed by the COMMITTEE ON SCIENCE AND ART OF THE FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA.



Plate No. 222.

Made in two sizes: Style A, Style B.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
A.	5 tons	4½ in.	1¾ in.	8½ in.	5 in.	18 lbs.	\$	Ruth

Used as a Truck Box Jack, and for work on Benches, Lathes, and Machine Shop.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
B.	5 tons	6 in.	1¾ in.	11 in.	5 in.	25 lbs.	\$	McConaughy

Used as Car Box Jack, also for Electric Railway Companies and for general Car Truck Box work.

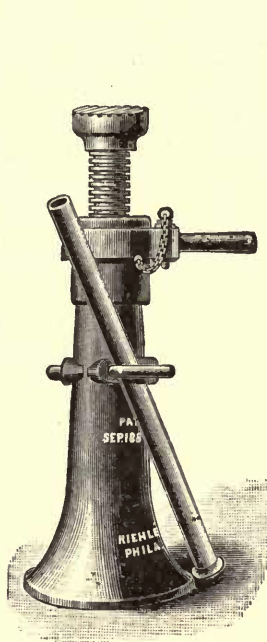


Plate No. 225.

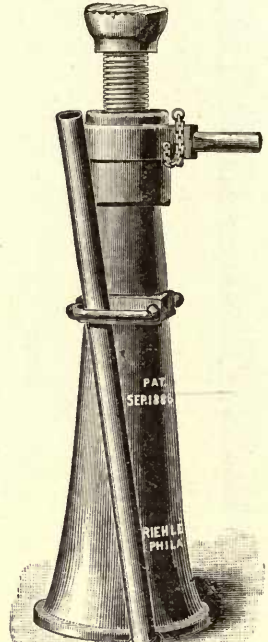


Plate No. 226.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
E.	20 tons	18 in.	2½ in.	25 in.	10 in.	110 lbs.	\$	Bonsall

This size Jack is desired for use by manufacturers of Boilers and Machinery, Electric Light Works, House Movers and Iron Workers, Car Works; is also used for Locomotive and Wrecking Work. Some men claim it is the best Jack for Wrecking use in existence.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
F.	20 tons	24 in.	2½ in.	32 in.	8 in.	130 lbs.	\$	Baker

This Jack is especially adapted for use under Passenger and Sleeping Coaches, or wherever a long run of a screw is required.



Plate No. 223.



Plate No. 224.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
C.	10 tons	8 in.	2 in.	14 in.	7 in.	48 lbs.	\$	Augustus

For general use this style has no equal; light and powerful; indispensable in Machine Shops and Foundries.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
D.	10 tons	18 in.	2 in.	24 in.	8½ in.	90 lbs.	\$	Angelus

Handy pattern about Machine Shop and Car Works. Useful where the shorter 10-ton is not tall enough.

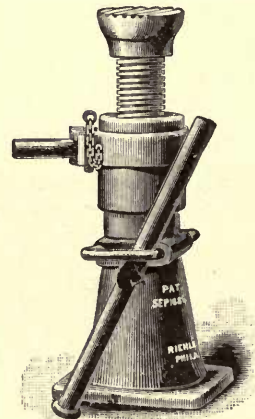


Plate No. 227.

Style.	Cap.	Lift.	Diameter Screw.	High.	Square Base.	Weight.	Price.	Tel.
G.	20 tons	10 in.	2½ in.	19 in.	8 in.	85 lbs.	\$	Clark

For Ship Yards, Railroad Work, Furnaces, and Rolling Mills, and for heavy work at Machine Shops and Foundries.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

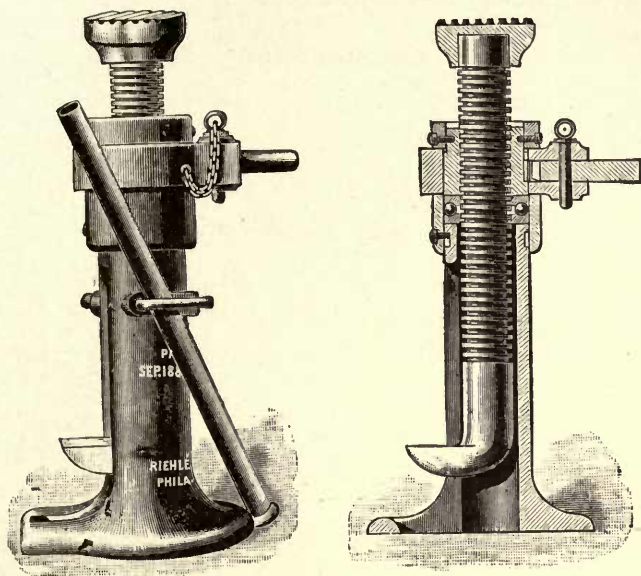


Plate No. 241.

Made in two sizes—Style H, Style I.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
H.	10 tons	8 in.	2 in.	18 in.	7 1/2 in.	58 lbs.	\$	Weaver

Useful at Boiler Works and for handling and moving Engines and Machinery; for moving Safes and Monumental Work. Indispensable for Masons and Builders.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
I.	20 tons	18 in.	2 1/2 in.	29 1/2 in.	10 in.	120 lbs.	\$	Browning

Used same as the lighter Foot-lift Jack, only for heavier weight.

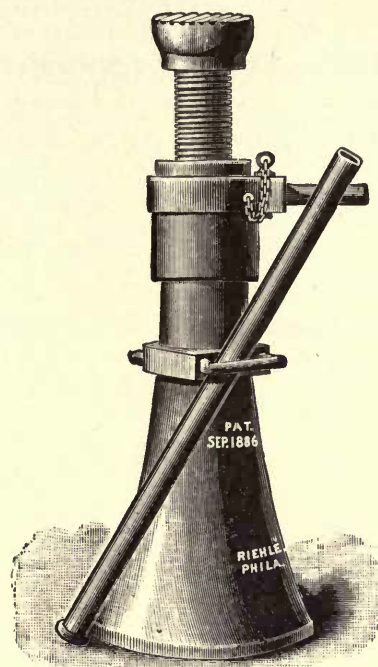


Plate No. 240.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
K.	30 tons	24 in.	3 in.	30 in.	12 in.	200 lbs.	\$	Binns

This Jack is also used at the Government Navy Yards and Stations, Proving Grounds; also Railroads and Steamship Companies, heavy Boiler Works, and Contractors.

## Something New

IN

### LIFTING JACKS.

The best Lifting Jack in the world for all purposes.

Frictionless ball bearings.

Lever and Ratchet Motion.

Screw does not rotate.

Cap will not turn under pressure.

No danger of upsetting, and other advantages.

### PLEASE READ THIS.

No Riehlé-Robie Jack

MADE WITHOUT

"Frictionless Ball Bearings."

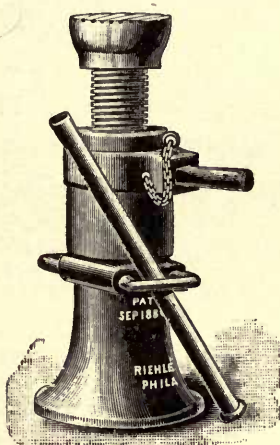


Plate No. 228.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
J.	30 tons	10 in.	3 in.	20 in.	10 in.	130 lbs.	\$	Furman

Used by the U. S. Government at the Navy Yard and Proving Grounds, by Locomotive Builders, Bridge Builders, and about Dry Docks.

Patented September 21st, 1886. Patented October 20th, 1891.

Please see Folios 90, 91, & 92 for Names and Addresses of Parties using these Jacks. *The list increases daily.*



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-ROBIE PATENT SCREW JACK, Continued.

### IN USE BY

#### UNITED STATES GOVERNMENT.

		Tons.
UNITED STATES ARSENAL (Ord. Dept.),	Watertown, Mass.,	1 30
U. S. NAVY YARD (Bu. of Con. and Rep.),	Brooklyn, N. Y.,	1 10 and 1 50
"	(Bu. of Ordnance),	Washington, D. C., 1 30
"	"	Norfolk, Va., 1 30
"	(Bu. of Con. and Rep.),	" 2 10
"	(Bu. of Ordnance),	Mare Island, Cal., 2 10

#### RAILROAD AND STEAMSHIP COMPANIES.

PENNSYLVANIA RAILROAD,	Renova, Pa.,	2 20
LEHIGH VALLEY RAILROAD,	S. Easton,	2 10
"	"	1 30
"	Bethlehem,	4 20
"	Hazleton,	1 20
"	Packerton,	1 20
MONT ALTO RAILROAD,	Mont Alto,	1 10
PITTSBURGH WESTERN RAILROAD,	Allegheny,	2 20
LEHIGH VALLEY RAILROAD,	Packerton,	2 20
NORFOLK & WESTERN RAILROAD Co.,	Roanoke, Va.,	4 30
"	(M. P. Dept.),	2 30
"	RAILROAD Co.,	10 30
RICHMOND & DANVILLE RAILROAD,	Richmond,	2 30
NORFOLK & WESTERN RAILROAD,	Salem,	1 10
NORFOLK & CAROLINA RAILROAD, Piner's	Point, Norfolk,	1 20
INT. & GT. NTHN. RY.,	Palestine, Texas,	2 15
EAST ST. LOUIS CONNECTION RAILROAD,	E. St. Louis, Ill.,	2 20
CHICAGO & NORTHWESTERN RAILROAD,	Chicago,	1 20
"	"	4 20
NEW YORK, SUS. & W. R. R.,	Wortendyke, N. J.,	1 20
FALL RIVER & PROV. STEAM'R CO.,	Fall River, Mass.,	1 06
R. M. MONROE,	Dade Co., Fla.,	1 20
PHILA. & READING C. AND I. CO.,	Pottsville, Pa.,	1 10
NEW HAVEN ROLLING MILL CO.,	New Haven, Ct.,	1 20
EMPIRE & NEW ENGLAND TRANS. CO.,	"	4 20
NEWPORT NEWS SHIP BLDG. CO.,	Newp't News, Va.,	4 30
PATERSON RY. CO.,	Paterson, N. J.,	3 10
JOHNSTOWN PASS. RY. CO.,	Johnstown, Pa.,	1 10
CITY PASSENGER RY. CO.,	Altoona, Pa.,	1 05
NEWPORT & SHERMAN VALL. R. R. CO.,	Newport, Pa.,	1 05
PHILA. & READING R. R.,	P't Richmond, Pa.,	2 05
"	"	2 10

#### IRON AND STEEL WORKS.

HENDRICK MFG. CO.,	Carbondale, Pa.,	1 10
DUNMORE IRON & STEEL CO.,	Dunmore,	2 20
"	"	1 20
HALDEMAN GRUBB & CO.,	Chickies,	1 20
PENNSYLVANIA STEEL CO.,	Steelton,	2 20
WESTON FURNACE CO.,	Manistique, Mich.,	4 20
MAX MEADOWS IRON CO.,	Max Meadows, Va.,	1 10
PULASKI DEVEL. CO.,	Pulaski,	2 10
"	"	2 20
VOLK & MURDOCK IRON WORKS,	Charleston, S. C.,	1 10
STANDARD STEEL WORKS,	Logan, Pa.,	1 10
BURDEN IRON WORKS,	Troy, Y.,	1 10
CENTRAL IRON AND STEEL WORKS,	Harrisburg, Pa.,	1 20
LACKAWANNA IRON & COAL CO.,	Scranton,	2 20
THOMAS IRON COMPANY,	Hokendauqua,	2 10
"	"	2 20
CRANE IRON CO.,	Edge Hill,	1 10
CENTRAL IRON CO.,	Harrisburg,	1 10
DONALDSON IRON CO.,	Emaus,	1 10
MIDVALE STEEL CO.,	Nicetown,	1 30
R. & A. HECKSCHER & CO.,	Swedeland,	1 10
OXFORD IRON & NAIL CO.,	Oxford, N. J.,	1 10
SALEM FURNACE CO.,	Salem, Va.,	2 10
COCHRAN ORE CO.,	Hamilton, Ga.,	1 10
INDIANA STEEL CO.,	Indianapolis, Ind.,	2 10
McKEESPORT IRON WORKS,	McKeesport, Pa.,	1 20
CAMBRIA IRON CO.,	Johnstown,	2 20

#### ROLLING MILLS.

		Tons.
MARSHALL BROS.,	Philadelphia, Pa.,	1 30
THEO. OLIVER,	S. Easton,	2 20
WORTH BROS.,	Coatesville,	1 10
JONES & LAUGHLINS,	Pittsburgh,	2 20

#### STEAMSHIP AND ENGINE BUILDERS.

CHICAGO SHIP BUILDING CO.,	South Chicago, Ill.,	4 30
BROWN & MILLER,	Jersey City, N. J.,	1 10
WM. CRAMP & SONS,	Philadelphia, Pa.,	2 30
I. P. MORRIS CO.,	"	1 10
JOHN ROACH & SONS,	Chester,	1 10
DAVIES & THOMAS,	Catasauqua,	2 10
AMERICAN SEEL BARGE CO.,	Duluth, Minn.,	4 10
"	"	2 30
NEWP'T NEWS SHIP BULD'G & D. DOCK CO.,	Newp't News, Va.,	2 10
"	"	2 20

#### MACHINISTS AND BOILER MAKERS.

WILSON & YEAGER,	Reading, Pa.,	1 10
HENRY VOGT & BRO.,	Brooklyn, N. Y.,	1 10
THOMSON-HOUSTON CO.,	Boston, Mass.,	2 20
FRICK & CO.,	Waynesboro', Pa.,	2 20
HARRISBURG F'DY. MACHINE CO.,	Harrisburg,	2 10
WEIMER MACHINE WORKS CO.,	Lebanon,	1 10
COGHLANS HOLYOKE S. B. & W. W'KS,	Holyoke, Mass.,	1 10
BRADLEY & HUBBARD CO.,	Meriden, Conn.,	1 10
M. J. DALY,	Waterbury,	1 10 and 1 20
H. R. WORTHINGTON,	New York, N. Y.,	2 10
CLOUBROCK BOILER WORKS,	Brooklyn,	1 10
ALLENTOWN BOILER WORKS,	Allentown, Pa.,	1 10
WINDSOR CO.,	N. Adams, Mass.,	1 10
SKINNER & ARNOLD,	Albany, N. Y.,	1 20
MANN EDGE & TOOL CO.,	Lewistown, Pa.,	1 10

#### MINING COMPANIES.

CONE BROS. & CO.,	Drifton, Pa.,	2 10
GEO. RICHARDS CO.,	Dover, N. J.,	1 10
LINDERMAN & SKEER,	Bethlehem, Pa.,	1 20
CALUMET & HECLA MINE,	Calumet, Mich.,	2 30
LACKAWANNA & W. B. C. CO.,	Audenreid, Pa.,	1 10
PARDEE BROS. & CO.,	Hazleton,	1 10
OLD BANGOR SLATE CO.,	Bangor,	1 10
JACKSON BROS., SLATE MANUF'G CO.,	Pen Argyle,	1 10

#### MANUFACTURERS.

ERBEN, SEARCH & CO.,	Tacony, Phila.,	1 10
"	"	2 30
M. RUMELY CO.,	La Porte, Ind.,	1 10
UNION COTTON MANUF'G CO.,	Fall River, Mass.,	1 10
AMERICAN LINEN CO.,	"	1 10
TROY COTTON & WOOLEN MANUF. CO.,	"	1 10
WHITTENTON MFG. CO.,	Taunton,	1 06
UNION WADDING CO.,	Pawtucket, R. I.,	1 10
GOODYEAR'S IN. RUB. GLOVE M'G CO.,	Naugatuck, Ct.,	1 10

#### CONTRACTORS AND DRY DOCKS.

HOWARD H. HOBSON,	Brandon, N. Y.,	6 10
WM. GOKEY & SON,	Brooklyn,	2 30
F. O. NORTON,	Binnewater,	1 10
THEO. BEAUMONT,	Wayne, Pa.,	1 10
CONRAD SCHROEDER,	Scranton,	1 10
S. P. BACHMAN,	Easton,	1 00
G. F. JOHNSON,	Bangor,	1 10
THOMAS OAKES,	Bloomfield, N. J.,	1 10
SAML. SMITH & SONS,	Paterson,	1 10
W. SWIFT,	"	2 10
G. & D. McWILLIAMS,	Jersey City,	2 20
HEATH & SMITH,	"	1 10



**RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.**

### RIEHLÉ-ROBIE PATENT SCREW JACK, Continued.

		<i>Tons.</i>
WM. EVANS, . . . . .	S. Boston, Va.,	1 10
JUSTIN MCCARTHY, . . . . .	Port Royal Dry Docks, S. C.,	3 20
JOHN LAWLER, . . . . .	Prairie Du Chien, Wis.,	2 30
JANNEY & BUFFINGTON, . . . . .	N. Bedford, Mass.,	1 10
SANFORD & MANCHESTER, . . . . .	Fall River, “	1 10
PETER LALINE, . . . . .	Providence, R. I.,	1 10
D. B. CRUICKSHANK, . . . . .	“	1 10
HOLLINGSWORTH & COUGHLAN, . . . . .	Chicago, Ill.,	2 20
SIMPSON & LEAVITT, . . . . .	Bristol, Conn.,	1 10
JOHN KENNEDY, . . . . .	Hartford, “	1 10
C. M. BALDWIN, . . . . .	New Haven, “	1 10
FRANK GOKEY, . . . . .	Hoboken, N. J.,	1 20

## PUBLIC WORKS.

A. B. DRAKE, Supt. Public Works,	N. Bedford, Mass.,	1	10
ANTHONY THURSTON, Supt. Pub. W'ks,	Fall River, "	1	20
S. W. COFFIN & SONS,	Cincinnati, O.,	1	30
WM. GOKEY,	Brooklyn, N. Y.,	2	30

**BREWERS.**

ARNOLD & KRELI, . . . . .	Hazelton,	Pa.,	1 10
CHAS. G. STIFFEL'S BREWING CO., . . . .	St. Louis,	Mo.,	1 10
LYON BREWING CO., . . . . .	Newark,	N. J.,	1 10
WM. SMITH & CO., . . . . .	E. Boston,	Mass.,	1 10

## DEALERS.

		<i>Tons.</i>
HAZLETON MACH. AND SUPPLY Co., . . . .	Hazleton,	Pa., 2 20
SOUTHERN RAILWAY SUPPLY Co., . . . .	Richmond,	Va., 2 10
T. E. BARKER & Co., . . . . .	Pawtucket,	R. I., 1 10
BELCHER & LOOMIS, . . . . .	Providence,	" 1 10
C. M. EDICK, . . . . .	Benton Harbor,	Mich., 2 10
INNES & Co., . . . . .	Poughkeepsie,	N. Y., 1 05
STANDARD STEEL Co., . . . . .	Pittsburgh,	Pa., 2 10

MISCELLANEOUS.

OLD BANGOR SLATE CO.,	Bangor,	Pa.,	1 10
" " "	"	"	2 10
JACKSON BROS.,	Pen Argyle,	"	1 10
FRANK GOKEY,	Hoboken,	N. J.,	1 20
GEO. R. LOMBARD & Co.,	Augusta,	Ga.,	1 10
MAYER & Co.,	Norfolk,	Va.,	1 10
" " "	"	"	1 20
DANIEL RUSSEL,	S. Boston,	Mass.,	1 10
A. J. WILKINSON & Co.,	Boston,	"	1 10
DAVID DUFF & SONS,	New Bedford,	"	1 10
GEO. D. WEBB,	Worcester,	"	1 10
L. R. TITUS,	Providence,	R. I.,	1 10
HAGEN & DALY,	Long Island City,	"	1 10
COPLAY CEMENT CO.,	Coplay,	Pa.,	1 10
C. F. McMURRAY,	Troy,	N. Y.,	1 10

PLEASE SEE WHAT THOSE WHO ARE USING THE ROBIE PATENT SCREW JACKS SAY ABOUT THEM.  
EXTRACTS FROM LETTERS AND REPORTS.

*New York Navy Yard, December 29, 1886.*

In obedience to the order of Commander H. B. Robeson, U. S. N., we have carefully tested the Patent Screw Jack of Henry W. Robie, and respectfully report :—

The advantages of this jack over the ordinary screw jack are :

*First*.—In overcoming the sliding friction of the screw underneath the cap by means of the balls, thereby adding greatly to the power. This friction amounts to 33 per cent. of the power exerted.

*Second.*—The movement of the screw is vertical, as in a hydraulic jack, and not revolving.

*Fourth.*—The power, when exerted on the nut by means of the ratchet, can be used to the greatest advantage in confined spaces, and in positions where an ordinary screw jack could not be used.

We have been unable to discover any disadvantages in the operation of this jack, and, therefore, *recommend it for purchase and use*, as required by the Act approved July 18th, 1861. We are, sir, very respectfully,  
Your obedient servants,

Your obedient servants,

JNO. W. MOORE, Chf. Eng., U. S. N.

GEO. H. KEARNEY, P. A. Eng., U. S. N.

M. A. ANDERSON, Cadet Eng., U. S. N.

TO COMMODORE BANCROFT GHIRARDI, U. S. N., COMMANDANT.

MONT ALTO, PA. MONT ALTO RAILROAD CO.—We *prefer* it to any screw jack we have ever used.—G. B. WIESTLING, *Supt.*

NICETOWN, PHILADELPHIA. MIDVALE STEEL CO.—We *are using* the Robie Jack we bought of you.—CHAS. S. HARRAH, *Pres.*

HOKENDAQUA, PA. THOMAS IRON CO.—We find the Robie Patent Screw Jacks labor-saving and *satisfactory* in every respect.  
JOHN THOMAS, *Supt.*

ST. LOUIS, MO. STIFEL'S BREWING CO.—I consider the Robie Patent Screw Jack the *best* screw jack that has ever come under our observation.—JOHN ASHTON, *Supt.*

NAVY DEPARTMENT, BUREAU OF EQUIPMENT, WASHINGTON, D. C., JANUARY 28, 1891.—The Bureau informs you that a report has been received from the Commandant of the Boston Navy Yard, stating that the Robie Patent Screw Jack, submitted by you for trial, has been put to a severe and thorough test, and has been found to be an *excellent implement*.—GEO. DEWEY, *Chief of Bureau*.



## RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

WATERVLIET, WEST TROY, N. Y.—I regard the Robie Patent Screw Jack as a very desirable screw jack to have, and much *superior* to other screw jacks.—F. A. PARKER, *Lt.-Col. Ord. Dept., U. S. A.*

WATERTOWN ARSENAL, MASS.—Your Robie Patent Screw Jack is found to be the *best* screw jack we have used here.  
D. W. FLAGLER, *Col. Ord. Dept., U. S. A.*

U. S. NAVY YARD, MARE ISLAND, CAL.—I consider your Robie Patent Screw Jack the *best* in the market, and shall call for them whenever I have an occasion to require screw jacks.—J. W. MOORE, *Ch. Eng., U. S. N.*

DEVON, PA.—*I would not part* with the Robie Patent Screw Jack I bought of you.—T. BEAUMONT.

LA PORTE, IND.—We are well *pleased* with the Robie Patent Screw Jack we bought of you.—M. RUMELY CO.

EMAUS, LEHIGH COUNTY, PA., JANUARY 17, 1891.—The Robie Patent Screw Jack is *all you* recommended it to be.—DONALDSON IRON CO.

WEST SUPERIOR, WIS., JANUARY 22, 1891.—We like the Robie Patent Screw Jack *very much*.—AMERICAN STEEL BARGE CO.

PRAIRIE DU CHIEN, WIS., JANUARY 16, 1891. PRAIRIE DU CHIEN AND MCGREGOR R. R.—I have subjected the Robie Patent Screw Jack to very heavy loads, and have found them to be *all that you claimed* for them.—JOHN LAWLER, *Prest.*

HARRISBURG, PA., JANUARY 14, 1891. CENTRAL IRON WORKS.—We are using the Robie Patent Screw Jack, and find it a most *excellent* device, and will gladly allow you to refer to us.—G. M. MCCAULEY, *Treas.*

CHICAGO, ILL., JANUARY 17, 1891.—Your Robie Patent Screw Jacks are the *best* we ever used.—INTERNATIONAL PACKING CO.

TUPPER'S LAKE, N. Y., JANUARY 16, 1891.—We are well pleased with the working of the Robie Patent Screw Jacks, and would recommend them to any one buying appliances of that kind, and should be pleased to have you *refer to us* if you have an occasion to.—HOBSON LUMBER CO.

CHESTER, PA., FEBRUARY 11, 1891. THE DELAWARE RIVER IRON AND S. S. AND ENGINE WORKS.—We have been using one of your Robie Patent Screw Jacks in our machine shop for the past six months or more, and have found it a very convenient and desirable tool. We would not willingly *be without it*. You can *refer to us* as to its merits, if you so desire.—(Signed) WM. PARKER, *Treas.*

MANISTIQUE, MICH. WESTON FURNACE CO.—“The Robie Jacks purchased of you have given satisfaction.”—H. DUVAL, *Sec.*

NEWPORT NEWS, VA. NEWPORT NEWS SHIPBUILDING & DRY DOCK CO.—“The Jacks you furnished us are giving good satisfaction.”—SOMMERS N. SMITH, *Gen. Supt.*

WAYNESBORO, PA. FRICK CO.—“We have been using the Riehlé-Robie Jack for some time and find it very satisfactory. You can refer to us.”—EZRA FRICK, *Sec.*

## The ROBIE PATENTED SCREW JACK

is awarded the Edward Longstreth Medal of Merit by the Committee on Science and the Arts of the Franklin Institute, of the State of Pennsylvania.



Report No. 1584.

(Below is a Copy of the Report.)

HALL OF THE FRANKLIN INSTITUTE,

PHILADELPHIA, January 4, 1891.

The Sub-Committee of the Committee on Science and the Arts, constituted by the Franklin Institute, of the State of Pennsylvania, to whom was referred for examination the Robie Screw Jack, report that the subject of this investigation is an improved screw jack patented to Henry W. Robie, September 21st, 1886, and the specimens submitted to your Committee are of the manufacture of Messrs. Riehlé Brothers, of Philadelphia.

In size and appearance the tool resembles the well-known form of screw jack, but in details of construction it differs very widely, and it is very much improved.

The base or pedestal is a hollow casting expanded at the bottom to form a wide foot, either round or square, as may be preferred.

On the top of the pedestal is mounted a revolving nut, through which the screw passes, extending down within the pedestal to the bottom.

The lower part of the nut extends some distance downward upon the outside of the pedestal, fitting it closely. A groove is cut around the pedestal near its top, which is covered by the projecting sleeve of the nut, and a set-screw tapped into this sleeve and entering the groove serves to secure the nut to the pedestal against accidental separation.

Between the base of the nut and the top of the pedestal are placed two concave rings of hardened steel, and between these rings, filling up the entire circle, upon steel balls upon which the nut, as it revolves, rolls, thus making nearly as possible a frictionless bearing. As the screw does not turn, but is raised and lowered by turning the nut, the cap of the screw does not revolve, but is firmly fastened to the screw; this arrangement entirely obviates the danger, so common in the use of ordinary jacks, of a liability to twist the cap from under the load.

The nut is provided with a ratchet lever to turn it in either direction, and as it only revolves, and does not rise with the screw, the hand lever is always operated to the best advantage.

The three sizes of the Robie Screw Jack submitted to your Committee by the manufacturers, viz.: the 10-ton, 20-ton, and 30-ton Jacks, are practical tools for what they are represented.

Your Committee has practically tested these under a testing machine, and demonstrated that one is able to raise double the weight by them that he could with a screw jack of the usual type, the pitch of the screw and length of hand lever being alike in both tools.

Aside from the many advantages possessed by the Robie Patent Screw Jack due to its form of construction, which may make it a very superior tool, those examined by your Committee, taken from the regular market stock, are entitled to high commendation in point of good proportions, excellent workmanship, and in the use of the very best materials, thus insuring the reliability and durability of the highest degree.

Your Committee cheerfully accord to the inventor of the Robie Jack Screw its deserved appreciation, and recommend, therefore, the award of the Longstreth Medal of Merit.

Respectfully submitted,

H. R. HEYL, *Chairman.*

D. E. CROSBY,

THOS. P. CONRAD.

February 4, 1891.

Adopted.

(Signed)

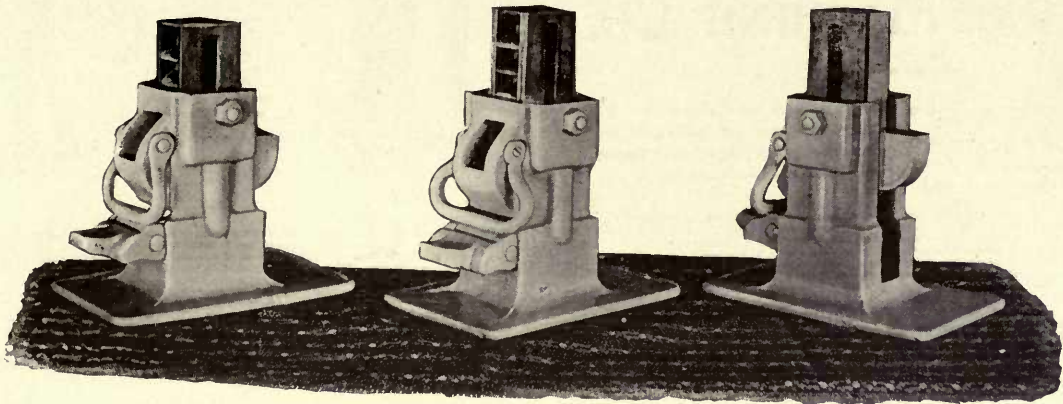
S. L. WIEGAND, *Chairman Committee on Science and Arts.*

WM. H. WAHL, *Secretary.*



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

RIEHLÉ-ANDERSON SAFETY TRACK JACK.



View 1. View 2. View 3.

Patented February 20th, 1894.

Plate No. 273.

Views 1 and 2 show a combined side and rear view, View 2 being slightly more extended, and View 1 showing the foot lift at the right. At the left are the handles for carrying the Jacks, and the trip for lowering the load. The rack teeth in rear of the lifting bar are also to be seen in Views 1 and 2, and below is the slot where the bar is inserted to raise the lift bar.

View 3 represents the front side and quarter of the Jack, with the toe lift prominently in front and to the right, and the retaining bolt is to be seen at the top of the frame in each view. These Jacks all have a substantial base with good bearing.

Telegraph.  
Anderson, . . . . . Price, \$

DIMENSIONS.

Extreme Height (lift down), . . . . .	8 in.
Extreme Length, . . . . .	9¾ in.
Extreme Width, . . . . .	6 in.
Weight, . . . . .	30 lbs.
Base Measure, . . . . .	9¾ x 6 in.
Top Measure, . . . . .	2½ x 1½ in.

ADAPTATION.

Minimum Lift, 0.  
Maximum Lift, 5½ in.  
(This applies equally to foot lift.)

DESCRIPTION AND OPERATION.

This Jack is probably the handiest, lightest, and most compact ever made for railroad or machine shop use. It impresses every one at first sight as being just what is wanted, especially for track work. It weighs only thirty pounds; is a direct, quick lifting, and instantaneous releasing Jack, and the release can be checked at any point. It is operated by a common crow-bar, and for all ordinary loads has been found to more than meet requirements.

The height of Jack from top of foot lift is less than 4½ inches, so that it never projects above the rail, thus avoiding any risk of derailing if left under track. The Jack remains at the required lift by the friction of rollers in a taper pocket, and is lowered by backing the rollers by means of a trip lever. The rapidity of lowering can be controlled by the same bar as used in raising, or it can be dropped by a blow of the bar on the trip.

An ordinary 1-inch steel track bar with 1⅜-inch nose can be used to operate this Jack.

REPORT OF TESTS.

November 8th, 1892.

The Robert W. Hunt & Co. Bureau of Inspection, Tests and Consultation, Chicago, Ill.

We would report on the test of Riehlé-Anderson Safety Track Jack submitted to us:

One man, weighing 150 lbs. could lift . . . . .	6,800 lbs.
“ “ “ 160 “ “ “ . . . . .	7,100 “
“ “ “ 170 “ “ “ . . . . .	7,690 “
Two men . . . . .	10,650 “
Three men . . . . .	13,500 “

A 4½ foot lever was used.

The Jack was tripped easily under load of 2,400 lbs. The Jack supported without slipping by load of 2,800 lbs., and slipped slightly under a heavier load.

(Signed) ROBT. W. HUNT & CO.

RIEHLÉ BROS. TESTING MACHINE CO.

Works, Ninth and Master Sts., Philadelphia. Office and Store, 19 N. Sixth St., Philadelphia.  
93 Liberty St., New York.



# RIEHLÉ BROS. TESTING MACHINE CO.

CONTAINING DESCRIPTIONS OF

Riehle U. S. Standard Patented Testing Machines.  
With the various appliances used with same.  
Riehle Standard Marble Molding and Countersinking Machines.  
And other marble-working tools.  
Riehle-Robie Patent Ball-bearing Screw Jacks.

Pig Metal Trucks and Turn-Tables.  
Power Hay and Straw Rope Twisters. Etc.  
Hydraulic Pumps and Presses & Special Machinery.  
Railroad and Warehouse Trucks, Etc.

THE RIEHLÉ TESTING MACHINES are of original design and finest construction, and are "the Standard of the World."  
The levers and weighing parts are tested and adapted to the U. S. Standard furnished as by the U. S. Government, Washington, D. C., and are to the standard of any nation, if desired. Tests of materials made daily and certificates furnished. Reports recorded and kept confidential. Riehle Bros. Testing Machine Co. have their own Drafting and Designing Room, Pattern and Machine Shop, and Foundry, which enables them to secure original designs and the best results.

ENGINEERS, IRON FOUNDERS AND GENERAL MACHINISTS  
DESIGNERS AND CONSTRUCTORS OF  
SPECIAL MACHINERY.

Tests of Materials made daily and Certificates Furnished. Reports recorded and kept Confidential.



SPECIAL APPENDIX OF  
"SUPPLY DEPARTMENT."

In Vol. 2.

Send for full sized circular and prices if you wish to purchase.

RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Illustrations of Standard Sizes of Riehle-Robie Ball-Bearing Screw Jacks.

Some makers of Jacks introduce a few under certain names, and after the name is known offer articles under the same name made in an inferior manner, and at a lower price. BEAR THIS IN MIND. "RIEHLÉ-ROBIE JACK" means a Jack with Frictionless Ball Bearings. Don't forget to ask the question when a Jack is offered for sale, "Has the Jack 'Frictionless Ball Bearings'?" All other Jacks are "AWAY BEHIND THIS TIME."

The RIEHLÉ-ROBIE JACKS are selling freely, and the list of users daily increasing. It is the only Jack adopted by the UNITED STATES GOVERNMENT also endorsed by the COMMITTEE ON SCIENCE AND ART OF THE FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA.



Plate No. 222.

Made in two sizes: Style A, Style B.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
A. 5 tons 4 1/2 in. 1 1/2 in. 8 1/2 in. 5 in. 48 lbs. \$ Bush  
Used as a Truck Box Jack, and for work on Benches, Lathes, and Machine-Shops.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
B. 5 tons 6 in. 1 1/2 in. 11 in. 5 in. 25 lbs. \$ McConaghy  
Used as Car Box Jack, also for Electric Railway Companies and for general Car Truck Box work.



Plate No. 223.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
E. 20 tons 18 in. 2 1/2 in. 25 in. 30 in. 110 lbs. \$ Bush  
This size Jack is desired for use by manufacturers of Boilers and Machinery, Electric Light Works, House Movers and Iron Workers (Car Works) is also used for Locomotive and Wrecking Work. Some men claim it is the best Jack for Wrecking use in existence.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
F. 20 tons 24 in. 2 1/2 in. 31 in. 8 in. 130 lbs. \$ Baker  
This Jack is especially adapted for use under Passenger and Sleeping Coaches, or wherever a long run of screw is required.



Plate No. 224.

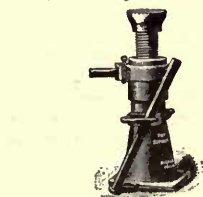


Plate No. 225.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
G. 20 tons 10 in. 2 1/2 in. 19 in. 6 in. 85 lbs. \$ Clark  
For Ship Yards, Railroad Work, Furnaces, and Rolling Mills, and for heavy work at Machine Shops and Foundries.



Plate No. 223.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
C. 10 tons 8 in. 2 in. 14 in. 7 in. 48 lbs. \$ Angustin  
For general use this style has no equal; light and powerful; indispensable in Machine Shops and Foundries.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
D. 10 tons 18 in. 2 in. 24 in. 8 1/2 in. 90 lbs. \$ Angustin  
Handy pattern about Machine Shop and Car Works. Useful where the shorter 10-ton is not tall enough.



Plate No. 224.

RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-ROBIE PATENT SCREW JACK.

SOMETHING NEW IN LIFTING JACKS.



Plate No. 161.

The Best Lifting Jack in the World for All Purposes.

Frictionless Ball Bearings!

Lever and Ratchet Motion!

Screw Does Not Rotate!

Cap Will Not Turn Under Pressure!

No Danger of Upsetting!

And other advantages not further described.

Patented September 23rd, 1886.  
October 20th, 1891.

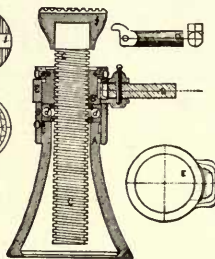


Plate No. 152.

### DESCRIPTION.

The ordinary form of screw jack has several serious defects in operating which are well known to every engineer and mechanic. One is that when the screw is raised to an undue height, there is always danger of springing it by the power exerted. Another defect lies in the application of the power directly underneath the cap, making it very inconvenient to work in most cases. The most serious defect of all, however, is that when there is a great force exerted the cap turns with the screw, by the friction produced, and is twisted from under the weight.

These difficulties have been overcome, and the screw jack made as complete for all lifting purposes as the hydraulic jack, and at a less cost, in the improved form illustrated. The following description and illustration will make its construction plain:

A is a pedestal, made hollow for the reception of the power screw C, and flaring at the low end to form the base or support. In the upper end of the pedestal is a circular groove a, and another groove c, is turned in the side of the pedestal a short distance below the upper end. The hooded nut B extends over the sides and is held in place by set screws, which revolve in the groove c, so that the nut B cannot be accidentally detached if the jack is upset. A series of balls is interposed between the upper surface of the pedestal and the bearing surface of the nut B, and the power screw C passes through the nut B, by which it is worked.

The upper end of the screw C is furnished with a removable head or rest, f, to give a wide bearing at its point of contact with the weight to be raised. The power nut B is provided with openings for receiving the operating lever, or a ratchet attachment may be used.

The operation is readily understood, the jack being placed under the weight and the power nut turned by means of a lever, or ratchet, causing the screw to be fed upward, and the weight lifted. The power nut remains stationary, so far as a vertical movement is concerned, and rotates upon the anti-friction rolls or balls.

### DIMENSIONS.

Telegraph. Capacity.	4 1/2 in. lift.	1 1/2 in. diam. screw.	8 1/2 in. high.	5 in. diam. base.	weight.	18 lbs.	Price.
Rush.	5 tons.	7	1 1/2	11	5	15	\$
McConaghy	5	7	1 1/2	11	5	15	\$
Angustin.	10	8	2	14	7	40	\$
Weaver.	10	8	2	14	7 1/2	58	foot-lift.
Angustin.	10	10	2	18	8 1/2	60	\$
Clark.	20	10	2 1/2	19	8	35	\$
Bushell.	20	10	2 1/2	19	8	110	10 in. diam.
Browning.	20	18	3 1/2	30 1/2	10	120	foot-lift.
Baker.	20	24	3 1/2	32	8	130	\$
Furness.	30	10	3	20	10	110	\$
Bush.	30	24	3	30	12	200	\$

Send for list of names of those using the Riehle-Robie Frictionless Patent Screw Jacks.

RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

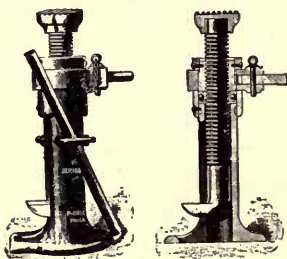


Plate No. 241.

Made in two sizes—Style H, Style L.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
H. 10 tons 8 in. 2 in. 18 in. 7 1/2 in. 58 lbs. \$ Weaver  
Useful at Boiler Works and for handling and moving Engines and Machinery; for moving Safe and Miscellaneous Work. Indispensable for Masons and Builders.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
L. 20 tons 18 in. 2 1/2 in. 29 1/2 in. 10 in. 130 lbs. \$ Browning  
Used same as the lighter Foot-lift Jack, only for heavier weight.



Plate No. 240.

Style. Cap. Lift. Diameter. Diameter. High. Base. Weight. Price. Td.  
K. 30 tons 24 in. 3 in. 30 in. 12 in. 200 lbs. \$ Bush  
This Jack is also used at the Government Navy Yard, and Stations, Proving Grounds; also Railroads and Steamship Companies, heavy Boiler Works, and Constructors.

### Something New

#### LIFTING JACKS.

The best Lifting Jack in the world for all purposes.

Frictionless ball bearings.

Lever and Ratchet Motion.

Screw does not rotate.

Cap will not turn under pressure.

No danger of upsetting, and other advantages.

PLEASE READ THIS.

No Riehle-Robie Jack

MADE WITHOUT

"Frictionless Ball Bearings."

Patented September 23rd, 1886. Patented October 20th, 1891.  
Please see Folios 6 and 7 for Names and Addresses of Parties using these Jacks. The list increases daily.

THESE JACKS ARE ADOPTED BY THE U. S. GOVERNMENT.

The Riehle-Robie Frictionless Patent Screw Jacks are adopted by the U. S. Government. They were awarded the Edward Longstreth Medal of Merit by the Committee on Science and the Arts of Franklin Institute of the State of Pennsylvania.



**RAILROAD AND WAREHOUSE  
TRUCKS.**

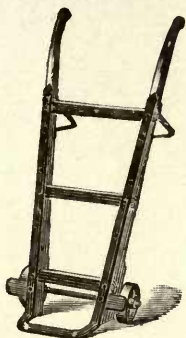


FIG. 500.

**NEW STEVEDORE TRUCK.**

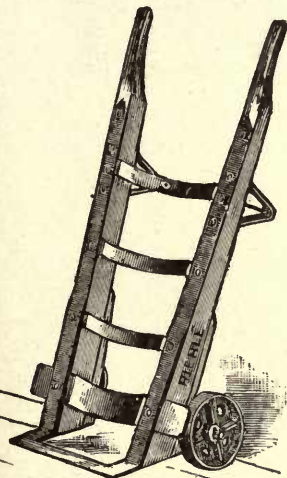


FIG. 505.

**DRY GOODS TRUCK.**

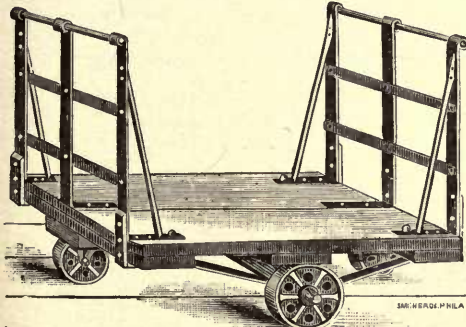


FIG. 532.

**SLAB TRUCK.**

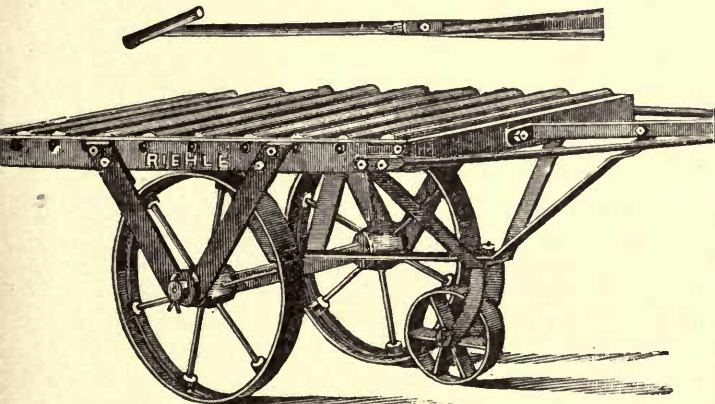


FIG. 144.

# Riehlé Bros. Testing Machine Co.

MANUFACTURE

TRUCKS OF ALL VARIETY AND  
DESCRIPTION,

SUCH AS

Railroad and Warehouse Trucks.

Barrel Trucks.

Cotton Warehouse Trucks.

Stevedore Trucks.

Bag Trucks for Mills.

Hotel Trucks.

Trunk Carriers.

Carpet Trucks.

Shoe-box Trucks.

Special Wool Trucks.

Wool Crates.

Grain and Wheat Barrows.

Wagon Barrows.

Metal Trucks.

Baggage Barrows.

Curved Baggage Barrows.

Four Wheel Express Barrows.

Dry Goods Trucks.

Crane's Patent Linen Fibre Warehouse Baskets.

Rattan Store Baskets.

Market-house Trucks.

"Star" Ham Trucks.

Bacon Trucks.

Pork Trucks.

Warehouse Platform Trucks.

Marble and Stone Trucks.

Paper Dealers' Horses.

Paper Dealers' Trucks.

Box Trucks.

Six-Wheel Box Trucks.

Lumber Trucks.

Pressroom Paper Trucks.

Contractors' and Builders' Trucks.

Skids.

**OCEAN STEAMSHIP TRUCK**

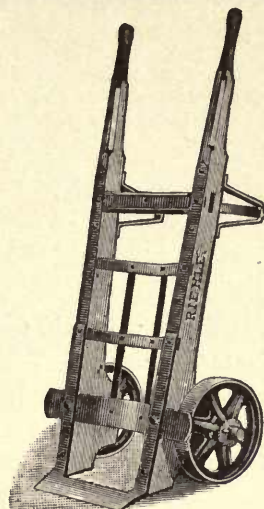


FIG. 552.

**BAGGAGE BARROWS.**

(Heavy Pattern.)

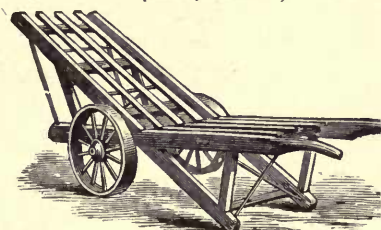


FIG. 523.

**EXPRESS AND BAGGAGE WAGON**

Improved Pattern.

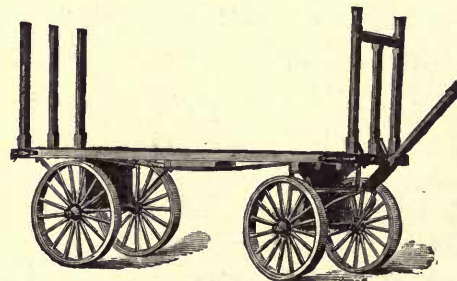


FIG. 563.

**MACHINE-SHOP TRUCK.**

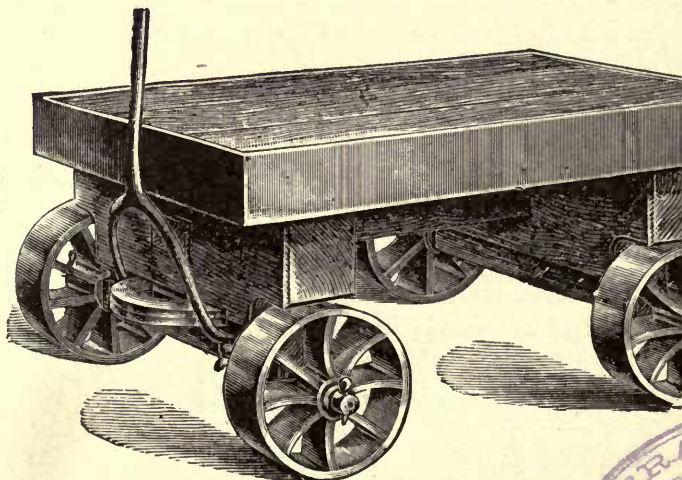


FIG. 582.



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**ILLUSTRATED  
CATALOGUE No. 3**

**In Two Volumes. Vol. II.**

CABLE ADDRESS:  
RIEHLÉ, PHILADELPHIA, U. S. A.

EACH ARTICLE HAS A TELEGRAPH NAME, AND THE  
CODE ON PAGE 2 WILL ENABLE CUSTOMERS  
TO ORDER BY WIRE WITH FACILITY.

**RIEHLÉ BROS.  
TESTING MACHINE Co.**

**(SUPPLY DEPARTMENT)**

CONTAINING DESCRIPTIONS OF

Riehlé-Robie Patent Ball-Bearing Screw Jack,  
Railroad, Warehouse, and Steamship Trucks and  
Barrows,  
Dry Goods and Express Trucks of Every Description,  
Clark's Patent Rubber Wheels and Casters,  
Cast-Iron Wheels, Plain and Flanged,  
Cast-Iron Wheels and Casters,

Metal and Wooden Barrows,  
Charging Cars and Barrows,  
Ventilating and Exhaust Fans,  
Portable Hoists,  
Road Scrapers and Rollers,  
Screw and Hydraulic Jacks,  
Chain, Etc.

For detailed table of contents, please see back page.

The Riehlé Bros. Testing Machine Co. furnish through their Supply Department the extensive list of articles contained in back of this Catalogue.

They are the sole makers of the Riehlé-Robie Patented Ball-Bearing Screw Jack, and also make a large and varied assortment of Wooden Trucks, and are arranged to design and construct special trucks of all descriptions.

At the back of this Catalogue is found a detailed table of contents of Catalogue No. 3, Vol. I, and we respectfully draw the attention of the public thereto.

If you can use one of these Catalogues (Catalogue No. 3, Vol. I) to our advantage, they will be furnished free upon application.

Riehlé Bros. Testing Machine Co. have their own draughtsman's and designing room, pattern and machine shops, and Foundry.

**❖ ENGINEERS, IRON FOUNDERS AND GENERAL MACHINISTS ❖**

**DESIGNERS AND CONSTRUCTORS OF**

**SPECIAL MACHINERY.**

Tests of Materials made daily and Certificates Furnished. Reports recorded and kept Confidential.

**Works, Ninth St. above Master,**

**Store, No. 19 North Sixth Street,**

(ABOVE MARKET ST.)

**PHILADELPHIA, PA., U. S. A.**

**NEW YORK OFFICE, 93 LIBERTY STREET.**



## Each Article Has a Telegraph Name.

### TELEGRAPH CODE.

Please send as soon as possible by telegraph, . . . . .	AGINCOURT.
" " " " mail, . . . . .	ADVANCE.
" " " " express, f. o. b. Philadelphia, . . . . .	ABERCORN.
" " " " railroad, " " . . . . .	CUMBERLAND.
" " " " boat, " " . . . . .	CUBA.
How soon can you deliver, . . . . .	CROTON.
What is your lowest figure for, . . . . .	CROSBY.
We have a communication from you about, . . . . .	ATKINSON.
Have you a communication from us about, . . . . .	ALDERSHOT.
Can we book your order for, . . . . .	ALDERMAN.
Please confirm your communication of . . . . . by repeating it by telegraph, . . . . .	ADMINISTRATION
Please confirm your communication of . . . . . by repeating it by mail, . . . . .	ALTITUDE.
Please reply by telegraph, . . . . .	BABYLON.
Please reply by mail, . . . . .	BANCROFT.
Offer accepted and will receive our best attention, . . . . .	BANKRUPT.
Your order received and will receive our best attention, . . . . .	BOATSWAIN.
Cable Address: "RIEHLÉ PHILADELPHIA U. S. A."	

### RIEHLÉ BROS. TESTING MACHINE CO.

Own the following valuable United States Letters-Patent, and are the sole makers of Testing Machines and other articles covered by same.

These patents embody all the important features in all the latest improved machines and appliances.

Vertical Screw-Power Testing Machines, . . . . .	Date of Patent, . . . . .	July 2, 1889.
Vernier Poise for Beam, . . . . .	" " . . . . .	August 16, 1887.
Riehlé High Faced Wedge Grip, . . . . .	" " . . . . .	November 8, 1881.
Riehlé-Gray Automatic Weighing and Recording Attachment, . . . . .	Patent Pending.	
Riehlé-Sloane Micrometer Caliper, . . . . .	Date of Patent, . . . . .	July 7, 1891.
	Other Patents Pending.	
Riehlé-Buzby Automatic Electric Beam for Testing Machine, . . . . .	Patent Pending.	
Riehlé-Reeser Automatic Electric Beam for Testing Machine, . . . . .	Date of Patent, . . . . .	March 21, 1893.
Spring Testing Machine, . . . . .	Patent Pending.	
Marble Molding and Countersinking Machine, . . . . .	Date of Patent, . . . . .	September 14, 1886.
" " " " . . . . .	" " . . . . .	May 17, 1887.
Riehlé Hatcher Marble Molding Cutter, . . . . .	" " . . . . .	December 3, 1889.
Riehlé-Robie Ball Bearing Screw Jack, . . . . .	" " . . . . .	September 21, 1886.
" " " " . . . . .	" " . . . . .	October 20, 1891.







# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Illustrations of Standard Sizes of Riehlé-Robie Ball-Bearing Screw Jacks.

Some makers of Jacks introduce a few under certain names, and after the name is known offer articles under the same name made in an inferior manner, and at a lower price. BEAR THIS IN MIND. "RIEHLÉ-ROBIE JACK" means a Jack with Frictionless Ball Bearings. Don't forget to ask the question when a Jack is offered for sale, "Has the Jack 'FRICTIONLESS BALL BEARINGS?'" All other Jacks are "AWAY BEHIND THE TIMES."

The RIEHLÉ-ROBIE JACKS are selling freely, and the list of users daily increasing. It is the only Jack adopted by the UNITED STATES GOVERNMENT also indorsed by the COMMITTEE ON SCIENCE AND ART OF THE FRANKLIN INSTITUTE OF THE STATE OF PENNSYLVANIA.



Plate No. 222.

Made in two sizes: Style A, Style B.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
A.	5 tons	4½ in.	1¾ in.	8½ in.	5 in.	18 lbs.	\$	Ruth

Used as a Truck Box Jack, and for work on Benches, Lathes, and Machine Shop.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
B.	5 tons	6 in.	1¾ in.	11 in.	5 in.	25 lbs.	\$	McConaughy

Used as Car Box Jack, also for Electric Railway Companies and for general Car Truck Box work.

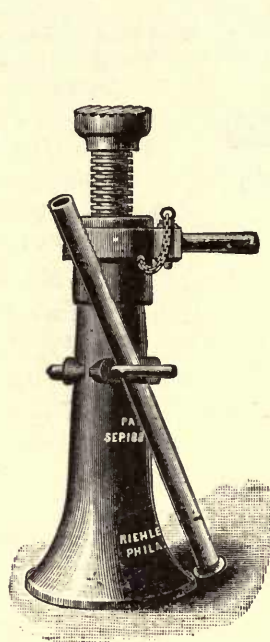


Plate No. 225.

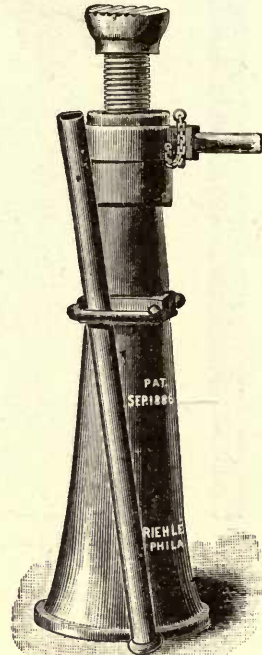


Plate No. 226.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
E.	20 tons	18 in.	2½ in.	25 in.	10 in.	110 lbs.	\$	Bonsall

This size Jack is desired for use by manufacturers of Boilers and Machinery, Electric Light Works, House Movers and Iron Workers, Car Works; is also used for Locomotive and Wrecking Work. Some men claim it is the best Jack for Wrecking use in existence.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
F.	20 tons	24 in.	2½ in.	32 in.	8 in.	130 lbs.	\$	Baker

This Jack is especially adapted for use under Passenger and Sleeping Coaches, or wherever a long run of screw is required.

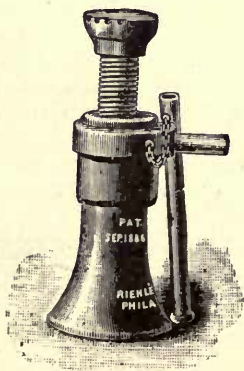


Plate No. 223.



Plate No. 224.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
C.	10 tons	8 in.	2 in.	14 in.	7 in.	48 lbs.	\$	Augustus

For general use this style has no equal; light and powerful; indispensable in Machine Shops and Foundries.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
D.	10 tons	18 in.	2 in.	24 in.	8½ in.	90 lbs.	\$	Angelus

Handy pattern about Machine Shop and Car Works. Useful where the shorter 10-ton is not tall enough.

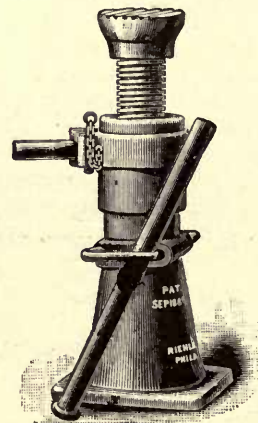


Plate No. 227.

Style.	Cap.	Lift.	Diameter Screw.	High.	Square Base.	Weight.	Price.	Tel.
G.	20 tons	10 in.	2½ in.	19 in.	8 in.	85 lbs.	\$	Clark

For Ship Yards, Railroad Work, Furnaces, and Rolling Mills, and for heavy work at Machine Shops and Foundries.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

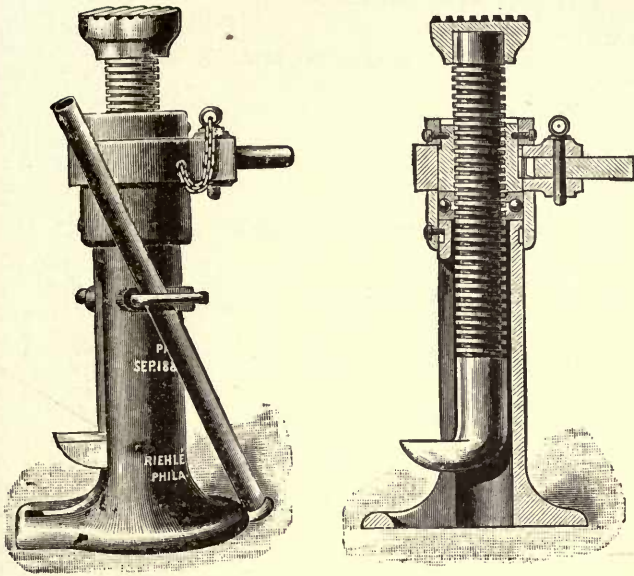


Plate No. 241.

Made in two sizes—Style H, Style I.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
H.	10 tons	8 in.	2 in.	18 in.	7½ in.	58 lbs.	\$	Weaver

Useful at Boiler Works and for handling and moving Engines and Machinery; for moving Safes and Monumental Work. Indispensable for Masons and Builders.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
I.	20 tons	18 in.	2½ in.	29½ in.	10 in.	120 lbs.	\$	Browning

Used same as the lighter Foot-lift Jack, only for heavier weight.

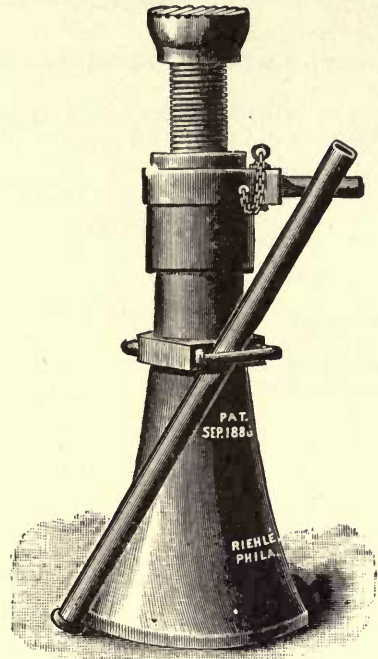


Plate No. 240.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
K.	30 tons	24 in.	3 in.	30 in.	12 in.	200 lbs.	\$	Binns

This Jack is also used at the Government Navy Yards and Stations, Proving Grounds; also Railroads and Steamship Companies, heavy Boiler Works, and Contractors.

## Something New

IN

### LIFTING JACKS.

The best Lifting Jack in the world for all purposes.

Frictionless ball bearings.

Lever and Ratchet Motion.

Screw does not rotate.

Cap will not turn under pressure.

No danger of upsetting, and other advantages.

### PLEASE READ THIS.

No Riehlé-Robie Jack

MADE WITHOUT

"Frictionless Ball Bearings."

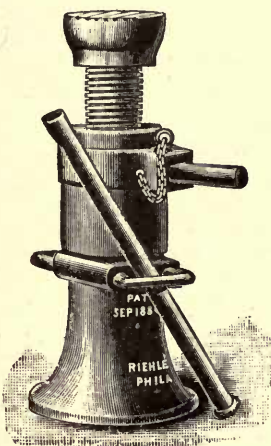


Plate No. 228.

Style.	Cap.	Lift.	Diameter Screw.	High.	Diameter Base.	Weight.	Price.	Tel.
J.	30 tons	10 in.	3 in.	20 in.	10 in.	130 lbs.	\$	Furman

Used by the U. S. Government at the Navy Yard and Proving Grounds, by Locomotive Builders, Bridge Builders, and about Dry Docks.

Patented September 21st, 1886. Patented October 20th, 1891.

Please see Folios 6 and 7 for Names and Addresses of Parties using these Jacks. *The list increases daily.*



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## RIEHLÉ-ROBIE PATENT SCREW JACK, Continued.

### IN USE BY

#### UNITED STATES GOVERNMENT.

		Tons.
UNITED STATES ARSENAL (Ord. Dept.),	Watertown, Mass.,	1 30
U. S. NAVY YARD (Bu. of Con. and Rep.),	Brooklyn, N. Y.,	1 10 and 1 50
" " (Bu. of Ordnance),	Washington, D. C.,	1 30
" " " " " "	Norfolk, Va.,	1 30
" " (Bu. of Con. and Rep.),	" " "	2 10
" " (Bu. of Ordnance),	Mare Island, Cal.,	2 10

#### RAILROAD AND STEAMSHIP COMPANIES.

PENNSYLVANIA RAILROAD,	Renova, Pa.,	2 20
LEHIGH VALLEY RAILROAD,	S. Easton,	" 2 10
" " " " " "	" " "	" 1 30
" " " " " "	Bethlehem,	" 4 20
" " " " " "	Hazleton,	" 1 20
" " " " " "	Packerton,	" 1 20
MONT ALTO RAILROAD,	Mont Alto,	" 1 10
PITTSBURGH WESTERN RAILROAD,	Allegheny,	" 2 20
LEHIGH VALLEY RAILROAD,	Packerton,	" 2 20
NORFOLK & WESTERN RAILROAD CO.,	Roanoke, Va.,	4 30
" " (M. P. Dept.),	" " "	" 2 30
" " RAILROAD CO.,	" " "	" 10 30
RICHMOND & DANVILLE RAILROAD,	Richmond,	" 2 30
NORFOLK & WESTERN RAILROAD,	Salem,	" 1 10
NORFOLK & CAROLINA RAILROAD, Finer's Point,	Norfolk,	" 1 20
INT. & GT. NTHN. RY.,	Palestine, Texas,	2 15
EAST ST. LOUIS CONNECTION RAILROAD,	E. St. Louis, Ill.,	2 20
CHICAGO & NORTHWESTERN RAILROAD,	Chicago,	" 1 20
" " " " " "	" " "	" 4 20
NEW YORK, SUS. & W. R. R.,	Wortendyke, N. J.,	1 20
FALL RIVER & PROV. STEAMBOAT CO.,	Fall River, Mass.,	1 06
R. M. MONKOE,	Dade Co., Fla.,	1 20
PHILA. & READING C. AND I. CO.,	Pottsville, Pa.,	1 10
NEW HAVEN ROLLING MILL CO.,	New Haven, Ct.,	1 20
EMPIRE & NEW ENGLAND TRANS. CO.,	" " "	" 4 20
NEWPORT NEWS SHIP BLDG. CO.,	Newp't News, Va.,	4 30
PATERSON RY. CO.,	Pateron, N. J.,	3 10
JOHNSTOWN PASS. RY. CO.,	Johnstown, Pa.,	1 10
CITY PASSENGER RY. CO.,	Altoona, Pa.,	1 05
NEWPORT & SHERMAN VALL. R. R. CO.,	Newport, Pa.,	1 05
PHILA. & READING R. R.,	P't Richmond, Pa.,	2 05
" " " " " "	" " "	" 2 10

#### IRON AND STEEL WORKS.

HENDRICK MFG. CO.,	Carbondale, Pa.,	1 10
DUNMORE IRON & STEEL CO.,	Dunmore,	" 2 20
" " " " " "	" " "	" 1 20
HALDEMAN GRUBB & CO.,	Chickies,	" 1 20
PENNSYLVANIA STEEL CO.,	Steelton,	" 2 20
WESTON FURNACE CO.,	Manistique, Mich.,	4 20
MAX MEADOWS IRON CO.,	Max Meadows, Va.,	1 10
PULASKI DEVEL. CO.,	Pulaski,	" 2 10
" " " " " "	" " "	" 2 20
VOLK & MURDOCK IRON WORKS,	Charleston, S. C.,	1 10
STANDARD STEEL WORKS,	Logan, Pa.,	1 10
BURDEN IRON WORKS,	Troy, Y.,	1 10
CENTRAL IRON AND STEEL WORKS,	Harrisburg, Pa.,	1 20
LACKAWANNA IRON & COAL CO.,	Scranton,	" 2 20
THOMAS IRON COMPANY,	Hokendauqua,	" 2 10
" " " " " "	" " "	" 2 20
CRANE IRON CO.,	Edge Hill,	" 1 10
CENTRAL IRON CO.,	Harrisburg,	" 1 10
DONALDSON IRON CO.,	Emaus,	" 1 10
MIDVALE STEEL CO.,	Nicetown,	" 1 30
R. & A. HECKSCHER & CO.,	Swedeland,	" 1 10
OXFORD IRON & NAIL CO.,	Oxford, N. J.,	1 10
SALEM FURNACE CO.,	Salem, Va.,	2 10
COCHRAN ORE CO.,	Hamilton, Ga.,	1 10
INDIANA STEEL CO.,	Indianapolis, Ind.,	2 10
MCKEESPORT IRON WORKS,	McKeesport, Pa.,	1 20
CAMBRIA IRON CO.,	Johnstown,	" 2 20

#### ROLLING MILLS.

		Tons.
MARSHALL BROS.,	Philadelphia, Pa.,	1 30
THEO. OLIVER,	S. Easton,	" 2 20
WORTH BROS.,	Coatesville	" 1 10
JONES & LAUGHLINS,	Pittsburgh,	" 2 20

#### STEAMSHIP AND ENGINE BUILDERS.

CHICAGO SHIP BUILDING CO.,	South Chicago, Ill.,	4 30
BROWN & MILLER,	Jersey City, N. J.,	1 10
WM. CRAMP & SONS,	Philadelphia, Pa.,	2 30
I. P. MORRIS CO.,	" " "	" 1 10
JOHN ROACH & SONS,	Chester,	" 1 10
DAVIES & THOMAS,	Catasauqua,	" 2 10
AMERICAN SEEL BARGE CO.,	Duluth, Minn.,	4 10
" " " " " "	" " "	" 2 30
NEWPT NEWS SHIP BUILD'G & D. DOCK CO.,	Newp't News, Va.,	2 10
" " " " " "	" " "	" 2 20

#### MACHINISTS AND BOILER MAKERS.

WILSON & YEAGER,	Reading, Pa.,	1 10
HENRY VOGT & BRO.,	Brooklyn, N. Y.,	1 10
THOMSON-HOUSTON CO.,	Boston, Mass.,	2 20
FRICK & CO.,	Waynesboro', Pa.,	2 20
HARRISBURG FBY. MACHINE CO.,	Harrisburg,	" 2 10
WEIMER MACHINE WORKS CO.,	Lebanon,	" 1 10
COGLANS HOLYOKE S. B. & W. W'KS,	Holyoke, Mass.,	1 10
BRADLEY & HUBBARD CO.,	Meriden, Conn.,	1 10
M. J. DALY,	Waterbury,	" 1 10 and 1 20
H. R. WORTHINGTON,	New York, N. Y.,	2 10
CLOUBROCK BOILER WORKS,	Brooklyn,	" 1 10
ALLENTOWN BOILER WORKS,	Allentown,	" 1 10
WINDSOR CO.,	N. Adams, Mass.,	1 10
SKINNER & ARNOLD,	Albany, N. Y.,	1 20
MANN EDGE & TOOL CO.,	Lewistown, Pa.,	1 10

#### MINING COMPANIES.

COXE BROS. & CO.,	Drifton, Pa.,	2 10
GEO. RICHARDS CO.,	Dover, N. J.,	1 10
LINDERMAN & SKEER,	Bethlehem, Pa.,	1 20
CALUMET & HECLA MINE,	Calumet, Mich.,	2 30
LACKAWANNA & W. B. C. CO.,	Audenreid, Pa.,	1 10
PARDEE BROS. & CO.,	Hazleton,	" 1 10
OLD BANGOR SLATE CO.,	Bangor,	" 1 10
JACKSON BROS., SLATE MANUF'G CO.,	Pen Argyle,	" 1 10

#### MANUFACTURERS.

ERBEN, SEARCH & CO.,	Tacony, Phila.,	1 10
" " " " " "	" " "	" 2 30
M. RUMELY CO.,	La Porte, Ind.,	1 10
UNION COTTON MANUF'G CO.,	Fall River, Mass.,	1 10
AMERICAN LINEN CO.,	" " "	" 1 10
TROY COTTON & WOOLEN MANUF. CO.,	" " "	" 1 10
WHITTENTON MFG. CO.,	Taunton,	" 1 06
UNION WADDING CO.,	Pawtucket, R. I.,	1 10
GOODYEAR'S IN. RUB. GLOVE M'G CO.,	Naugatuck, Ct.,	1 10

#### CONTRACTORS AND DRY DOCKS.

HOWARD H. HOBSON,	Brandon, N. Y.,	6 10
WM. GOKEY & SON,	Brooklyn,	" 2 30
F. O. NORTON,	Binnewater,	" 1 10
THEO. BEAUMONT,	Wayne, Pa.,	1 10
CONRAD SCHROEDER,	Scranton,	" 1 10
S. P. BACHMAN,	Easton,	" 1 00
G. F. JOHNSON,	Bangor,	" 1 10
THOMAS OAKES,	Bloomfield, N. J.,	1 10
SAML. SMITH & SONS,	Pateron,	" 1 10
W. SWIFT,	" " "	" 2 10
G & D. MCWILLIAMS,	Jersey City,	" 2 20
HEATH & SMITH,	" " "	" 1 10







# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Railroad and Warehouse Trucks.

### Eastern Pattern with Plain Slats.

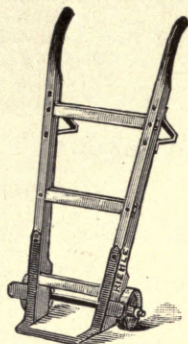


Fig. 500.

Full size. Extra heavy and well finished, with turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Half Ironed.	Tel.
No. 0	3-6	13	15	7	\$6.00	Gamalia
" 1	4-1	13	16	7½	7.00	Gurgle
" 2	4-5	15¾	19½	7¾	8.50	Guillotine
" 3	4-8	16	19¾	9¾	11.00	Graceful
" 4	5-0	16	20½	9¾	12.00	Greatness
" 5	5-4	17¾	23	11	16.50	Grander
" 6	6-1	18	24	11	18.00	Golden

Riehlé Bros. Testing Machine Co. make Special Trucks and Warehouse Appliances.

## Railroad and Warehouse Trucks.

### Eastern Pattern with Plain Slats.

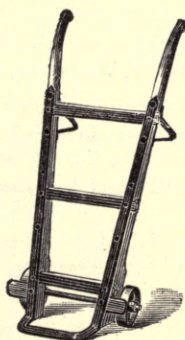


Fig. 501.

Full size. Extra heavy and well finished, with turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Full Ironed.	Tel.
No. 0	3-6	12	15	7	\$7.50	Gabardine
" 1	4-1	13	16	7½	8.00	Gabion
" 2	4-5	15¾	19½	7¾	10.00	Gabionage
" 3	4-8	16	19¾	9¾	12.50	Gabionnade
" 4	5-0	16	20½	9¾	14.50	Gablet
" 5	5-4	17¾	23	11	18.50	Gaddingly
" 6	6-1	18	24	11	20.50	Gadfly

## Railroad and Warehouse Trucks.

### Western Pattern.

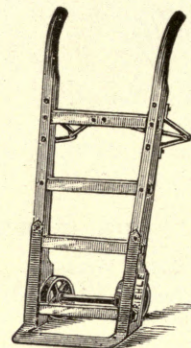


Fig. 502.

Full size. Extra heavy and well finished, with turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width. Ft. In.	Diam. of Wheels. Inches.	Price Half Ironed.	Tel.
No. 0	3-6	1-7	7	\$6.75	Good
" 1	4-1	1-9	7	7.50	Great
" 2	4-5	1-9	7¾	9.00	Gram
" 3	4-8	1-10	9¾	12.00	Gold
" 4	5-0	2-0	9¾	18.00	Gloat
" 5	5-4	2-0	11	20.00	Glare

Riehlé's Trucks are made of the best materials, and are strong and substantial.

## Railroad and Warehouse Trucks.

### Western Pattern.

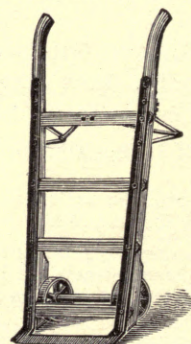


Fig. 503.

Full size. Extra heavy and well finished, with turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width. Ft. In.	Diam. of Wheels. Inches.	Price Full Ironed.	Tel.
No. 0	3-6	1-7	7	\$8.00	Gaditanian
" 1	4-1	1-9	7	8.50	Gadoid
" 2	4-5	1-9	7¾	10.75	Gadolinite
" 3	4-8	1-10	9¾	15.00	Gaelic
" 4	5-0	2-0	9¾	20.00	Gaffer
" 5	5-4	2-0	11	24.00	Gafe



Railroad and Steamship Trucks—  
Western Pattern.

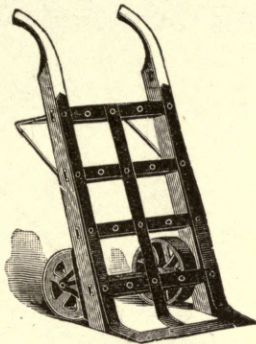


Fig. 587.

SIZE	LENGTH OF HANDLES, FT. IN.	WIDTH, FT. IN.	DIAM. OF WHEELS, INCHES.	WEIGHT, LBS.	PRICE.	TEL.
No. 1.	5 0	2 0	11	126	\$22 00	Affright
" 2.	5 2	2 0	11	135	24 00	Affluent
" 3.	5 2	2 0	12	175	26 00	Afflict

Extra heavy handles and cross-straps bolted through handles. Axles turned and wheels bored.

These trucks are made of the best selected hickory lumber. Iron on cross pieces extends through to outside of handles, with bolts passing through iron tenons and handles.

Heavy Railroad Truck.

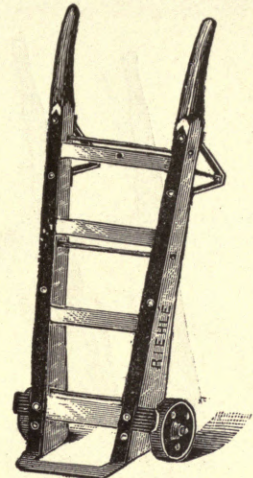


Fig. 504.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	4—6	13½	16½	10	\$14.00	Gig

Trucks well made out of seasoned lumber will outlast those made of inferior material.

Railroad and Steamship Trucks—  
Western Pattern.

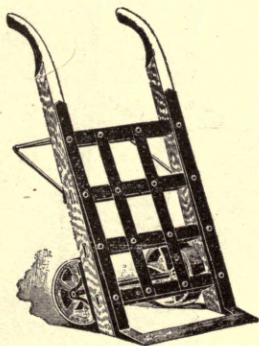


Fig. 588.

SIZE	LENGTH OF HANDLES, FT. IN.	WIDTH, FT. IN.	DIAM. OF WHEELS, INCHES.	WEIGHT, LBS.	PRICE.	TEL.
No. 1.	5 0	2 0	11	120	\$20 00	Afghan
" 2.	5 2	2 0	11	135	22 00	African
" 3.	5 6	2 1	12	150	24 00	Afloat

These trucks are made of the best selected hickory lumber. Iron on cross pieces extends through to outside of handles, with bolts passing through iron tenons and handles. Axles turned and wheels bored.

New Stevedore Truck.

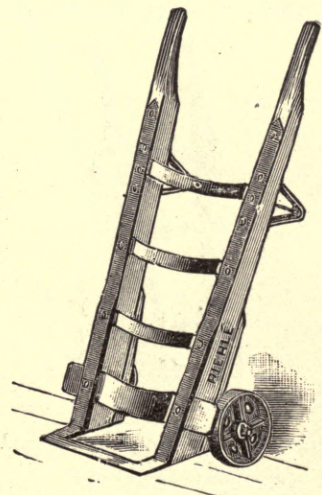


Fig. 505.

The above cut represents the strongest truck for railroad and steamer use made.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	5—0	13½	17	10	\$22.00	Game
" 2	5—0	17	20½	10	24.00	Dover

The United States Government uses Riehle Trucks.



**Ocean Steamship Truck.**

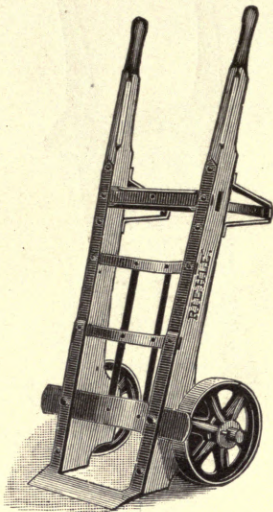


Fig. 552.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	5-6	18	24	14	\$35.00	Nevada

**Warehouse and Barrel Trucks.**

With Curved Iron Slats.

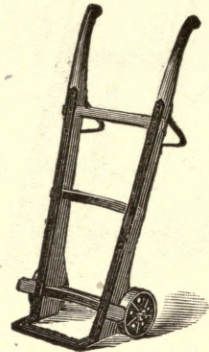


Fig. 507.

Full size. Extra stout, with turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Full Ironed.	Tel.
No. 0	3-6	12	15	7	\$8.00	Gahnite
" 1	4-1	13	16	7	10.00	Gainage
" 2	4-5	15 $\frac{3}{4}$	19 $\frac{1}{2}$	7 $\frac{3}{4}$	11.50	Galactine
" 3	4-8	16	19 $\frac{3}{4}$	9 $\frac{3}{4}$	14.50	Galago
" 4	5-0	16	20 $\frac{1}{2}$	9 $\frac{3}{4}$	20.00	Galangal
" 5	5-4	17 $\frac{3}{4}$	23	11	24.00	Galbanum
" 6	6-1	18	24	11	26.00	Galea

**Warehouse and Barrel Trucks.**

With Curved Iron Slats.

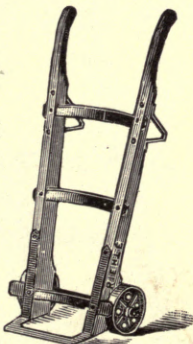


Fig. 506.

Full size. Extra stout, with turned and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Half Ironed.	Tel.
No. 0	3-6	12	15	7	\$6.75	Glass
" 1	4-1	13	16	7	7.50	Glory
" 2	4-5	15 $\frac{3}{4}$	19 $\frac{1}{2}$	7 $\frac{3}{4}$	9.00	Give
" 3	4-8	16	19 $\frac{3}{4}$	9 $\frac{3}{4}$	12.00	Glamor
" 4	5-0	16	20 $\frac{1}{2}$	9 $\frac{3}{4}$	18.00	Ghost
" 5	5-4	17 $\frac{3}{4}$	23	11	20.00	Ghoul
" 6	6-1	18	24	11	22.00	Greedy

The above is a most popular Truck.

**Cotton Warehouse Trucks.**

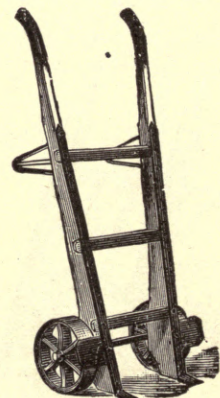


Fig. 508.

Full size. Extra heavy and well finished, turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Half Ironed.	Tel.
No. 2	4-5	15 $\frac{3}{4}$	17 $\frac{1}{2}$	7 $\frac{3}{4}$	\$9.00	Globe
" 3	4-8	16	19 $\frac{3}{4}$	9 $\frac{3}{4}$	12.00	Goat
" 4	5-0	16	20 $\frac{1}{2}$	9 $\frac{3}{4}$	18.00	Gas
" 5	5-4	17 $\frac{3}{4}$	23	11	20.00	Grove
" 6	6-1	22	24	11	22.00	Gypsy

This Truck is well designed, and well adapted for the purpose.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Cotton Warehouse Trucks.

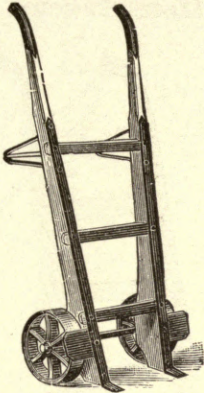


Fig. 509.

Full size. Extra heavy and well finished, turned axles and bored wheels.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price Full Ironed.	Tel.
No. 1	4-1	13	16	7½	\$8.50	Galimatias
" 2	4-5	15¾	17½	7¾	10.75	Galiot
" 3	4-8	16	19¾	9¾	15.00	Galliass
" 4	5-0	16	20½	9¾	20.00	Galletyle
" 5	5-4	17¾	23	11	22.00	Galoche
" 6	6-1	22	24	11	24.00	Gallicize

The above Truck is a labor-saver.

## "Phoenix" Barrel Truck.



Fig. 554.

Size.	Length of Handle. Inches.	Width at Nose. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	60	12	4 x 1	\$2.50	Idaho

The handiest truck made for carrying garbage and ash barrels. It is adapted to any size barrel or keg.

## Warehouse Truck.

(Berger's Patent.)

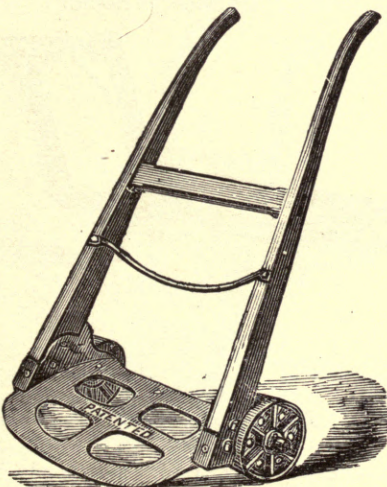


Fig. 553.

Size.	Length of Handle. Inches.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	55	24	21	6	\$10.00	Salem
" 2	58	27	21	7	12.00	Bridgeton

## Excelsior Hand Truck.

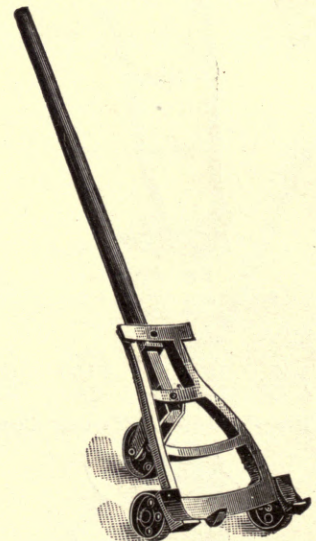


Fig. 555.

Size.	Length of Handle. Inches.	Width at Nose. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	56	15	4	\$5.00	Rabbit

This is a cheap, convenient truck for moving kegs, cases, etc. As shown in cut, underneath the bed of truck is set a stationary castor, the wheel of which if desired may rest on floor, thus effectually relieving truckman's hand from weight of load.



Salt Truck.

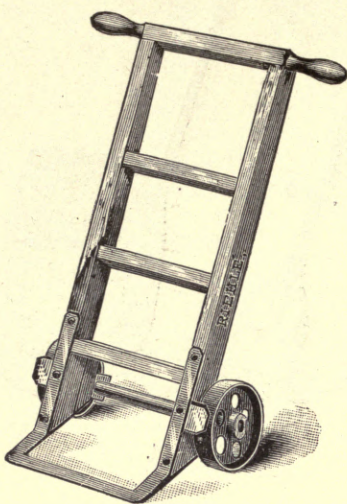


Fig. 556.

Size.	Length of Handle. Ft. in.	Width. Inches.	Price.	Tel.
No. 1	3—4	14	\$12.00	Camden
" 2	4—0	14	15.00	Gloucester

Hotel Trucks.

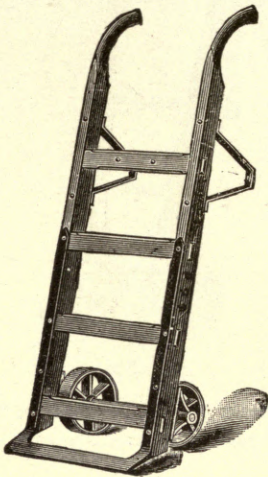


Fig. 512.

Size.	Length of Handle. Ft. in.	Diam. of Wheels. Inches.	Price.	With Rubbered Wheels Extra Nett.	Tel.
No. 0	3—6	7	\$8.00	\$4.00	Goodness
" 1	4—1	7	9.00	4.00	Guilt
" 2	4—5	7½	11.00	4.00	Guiltless
" 3	4—8	9½	12.00	6.00	Glitter

N. B.—For Rubbered wheels prefix R to the corresponding telegraph name, viz:—R Goodness.

Bag Trucks for Mills. Cast Iron Nose.

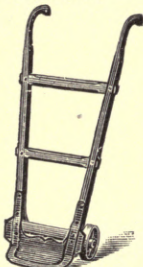


Fig. 510,

Well made. Strong and durable; turned axles and bored wheels.

Size.	Length of Handle. Ft. in.	Width. Inches.	Size of Wheels. Inches.	Price.	Tel.
No. 1	3—9	14	6	\$6.00	Grandma
" 2	4—0	14½	6	8.00	Gimlet

Yaggy's Bag-Holder & Truck Combined

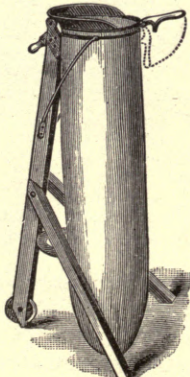


Fig. 511.

Size.	Price.	Tel.
No. 1.....	\$5.00	Giraffe

Trunk Carrier.

With Rubber Wheels.

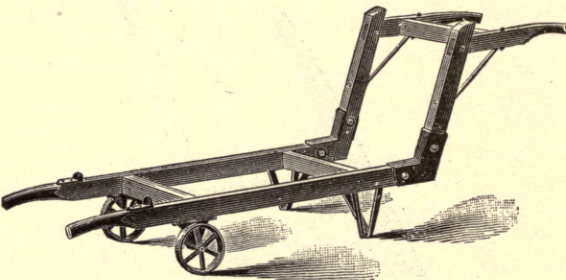


Fig. 513.

Extreme Length. Inches.	Extreme Width. Inches	Height, Inches.	Price.	Tel.
72	21	8	\$20.00	Galley

N. B.—For carrying trunks, boxes, etc. up or down stairs or steps, this carrier is unexcelled. Very convenient for hotels, colleges, etc.

Wheels can be put on either end, as desired.

Illustrated Testing Machine Price-Lists furnished upon application; also Illustrated Catalogue of Wheelbarrows and Contractors' requirements.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Carpet Truck.

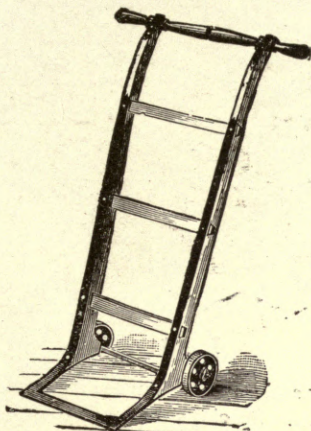


Fig. 514.

Size.	Length of Handle. Ft. In.	Diam. of Wheels. Inches.	Price.	Rubbered Wheels Extra Nett.	Tel.
No. 1	4—1	7	\$9.00	\$5.00	Gesture
" 2	4—5	7 $\frac{3}{4}$	11.00	5.00	Gyratory

N. B.—For Rubbered Wheels prefix R to the corresponding telegraph name, viz :—R Gesture.

Remember that the lowest price goods are not always the cheapest.

## "Shoe Box" Truck.

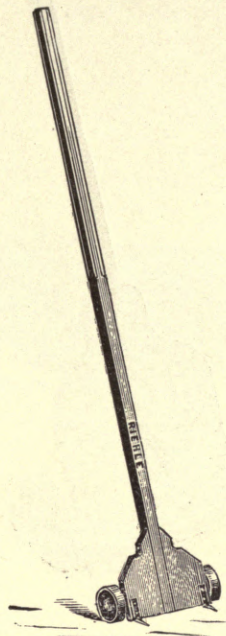


Fig. 516.

Size.	Length of Handle. Inches.	Width at Nose. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	60	8 $\frac{1}{2}$	3 $\frac{1}{2}$ x $\frac{7}{8}$	\$2.50	Goggle

## The "Brighton" Truck.

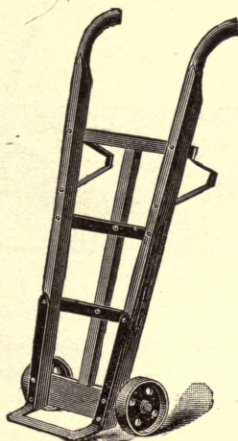
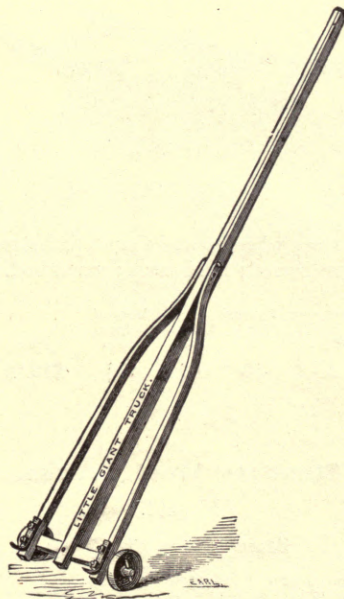


Fig. 515.

Size	Length of Hand'e. Ft. In.	Width at Nose. Inches.	Width at Upper Bar. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	3—10	12	17 $\frac{1}{2}$	6	\$5.00	Genii

Riehlé Bros. Testing Machine Co. have their own Foundry and Machine Shop, and are prepared to manufacture all kinds of Special Appliances.

## Little Giant Shoe Box Truck.



No. 517.

Size.	Length of Handle. Ft. In.	Width at Nose. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 2	4—7	10	3 $\frac{3}{4}$	\$3.00	Gong



"Hercules" Case Truck.



Fig. 557.

Size.	Size of Platform. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 100	9x15	4x1 $\frac{1}{4}$	\$2.50	Mackinaw
" 101	12x18	5x1 $\frac{1}{4}$	3.00	Glasgow
" 102	15x24	6x1 $\frac{1}{2}$	4.00	Columbus

Special Wool Truck.

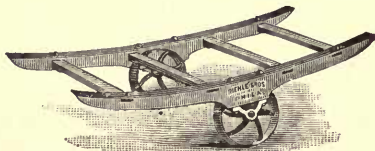


Fig. 518.

Turned axles; wheels bored; stout and strong, and well ironed; hard wood; varnished.

Extreme Length. Ft. In.	Extreme Height. Ft. In.	Extreme Width. Ft.	Weight. Lbs.	Diam. of Wheels. Inches.	Price.	Tel.
4-4	1-2	2	68	11 $\frac{3}{4}$	\$12.00	Wool

Standard Wool Trucks.

No. 591.

Same style as Fig. 500.

Size.	Length of Handle. Ft. In.	Diameter of Wheels. Inches.	Price.	Tel.
No. 5	5-4	11	\$15.00	Grocer

Wool Crate.

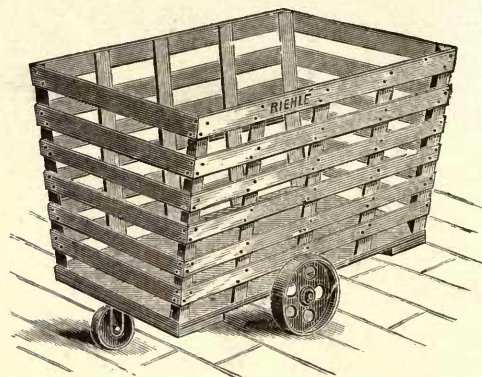


Fig. 519.

Very stout and strong. Turned axles and bored wheels. Special sizes made to order.

TOP MEASUREMENTS.					
Extreme Length. Ft.	Extreme Width. Ft.	Extreme Height. Ft.		Price.	Tel.
5	8	3			
BOTTOM MEASUREMENTS.					
Extreme Length. Ft.	Extreme Width. Ft.	Centre Wheels. Inches.		Price.	Tel.
5	2 $\frac{1}{2}$	8		\$30.00	Gallie

Wagon Barrows.

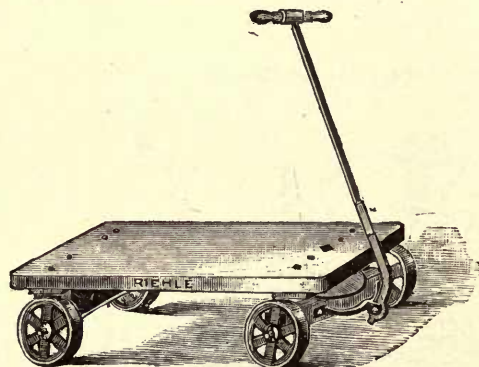


Fig. 520.

Four Wheels. Vibratory Axles. Extra strong and substantial. Turned Axles and Bored Wheels. Special sizes made to order.

Size.	Size of Platform. Ft. In.	Plain Tops.	Price With Slat.	With Slat and Iron Strapped.	Tel.
No. 1	3- x 2-	\$15.00	\$17.00	\$20.00	Gem
" 2	3-2 x 2-2	16.00	18.00	21.00	Guest
" 3	3-4 x 2-4	18.00	20.00	22.00	Gazelle
" 4	3-6 x 2-6	19.50	21.50	23.50	Gazette
" 5	3-8 x 2-8	22.00	23.00	25.00	Gander
" 6	3-10 x 2-10	23.00	25.00	26.50	Gazetteer

N. B.—Telegraph: words refer to Plain Trucks. Particulars must be specified in full.



Grain or Wheat Wagons.



Fig. 521.

Extra Heavy. Vibratory Axles.

Size.	Size of Platform.		Diam. of Wheels.	Price.	Tel.
	Ft. In.	Ft. In.	Inches.		
No. 10	3-0	5-0	14	\$35.00	Gambler
" 11	4-0	6-0	14	37.00	Gambling
" 12	6-0	8-0	18	48.00	Gambrel

Metal Truck.

(Light Pattern.)

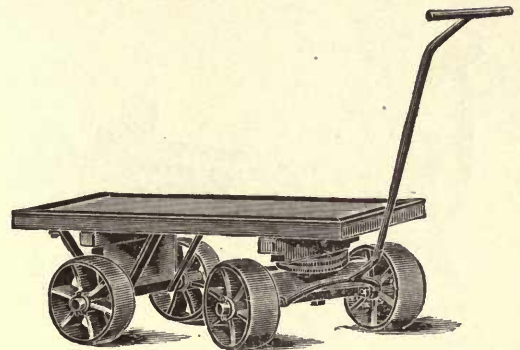


Fig. 558.

Size.	Size of Platform.	Diam. of Wheels.	Price.	Tel.
No. 1	Inches.	Inches.		
	42x20	9	\$30.00	Dakota

Riehlé Bros. Testing Machine Co. are prepared to make trucks of any size, style, material, and for any purpose required. If desired will make and submit drawings.

Metal Truck.

(Heavy Pattern.)



Fig. 522.

Size of Platform.	Diam. of Wheels.	Price.	Tel.
Ft. In. Ft. In.	Inches.		
3-6 x 1-8	11	\$40.00	Gilbert

Sheet Metal Truck.

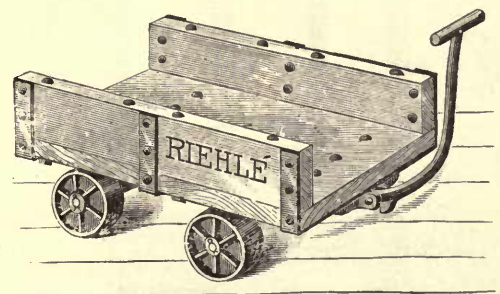


Fig. 559.

Size.	Size of Platform.	Height of Sides.	Diam. of Wheels.	Price	Tel.
	Ft. In. Ft. In.	Inches.	Inches.		
No. 1	3-6x2-0	8	8	\$30.00	Langdon

N. B.—This is a very heavy, strong and durable truck, made for handling tin plate, pig tin and other metals.

The Robie Patent Screw Jack, manufactured by Riehlé Bros. Testing Machine Co., is the best lifting jack in the world for all purposes. Send for prices.



Pipe Truck.

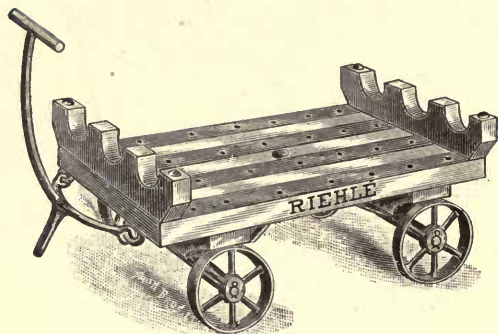


Fig. 560.

Size.	Size of Platform. Ft. In. Ft. In.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	8—9x2—4	17 <sup>5</sup> / <sub>8</sub>	\$50.00	American

Wire Truck.

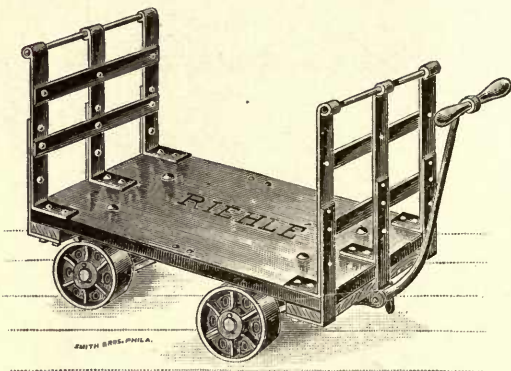


Fig. 562.

Size.	Size of Platform. Ft. In. Ft. In.	Price.	Tel.
No. 1	4—0x2—0	\$30.00	Hamilton
" 2	5—0x2—0	35.00	Monroe

By a liberal use of the best materials, together with real sound merit in construction and skillful workmanship, the machines manufactured by Riehlé Bros. Testing Machine Co. have become recognized as the "Standard."

Keg Truck.



Fig. 561.

Size.	Size of Platform. Ft. In. Ft. In.	Height of End Racks. Inches.	Diam. of Wheels. Inches.	Price.	Tel.
No. 1	6—9x1—5	30	13 <sup>3</sup> / <sub>8</sub> x4	\$65.00	Florida

For handling kegs in bulk this truck has been found very useful. Extra heavy, strong, substantial, and durable,

Baggage Barrows.

(Heavy Pattern)

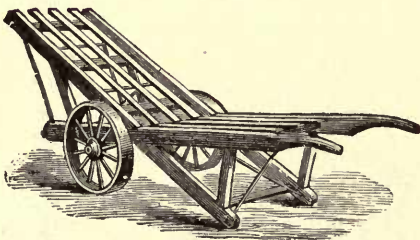


Fig. 523.

Two Wheels. Extra strong and substantial. Turned Axles and Bored Wheels. Special sizes made to order.

Size.	Description. Ft. In. long. wide.	Price. Strapped With Iron.	Full Strapped With Iron.	Tel.
No. 1	6—24	\$45.00	\$50.00	Gregory
" 2	9—27	55.00	60.00	Glad
" 3	9—30	65.00	*75.00	Goad

\*Extra Ironed.

N. B.—Telegraph words refer to plain trucks. Particulars must be specified in full.



Baggage Barrows.

(Light Pattern.)

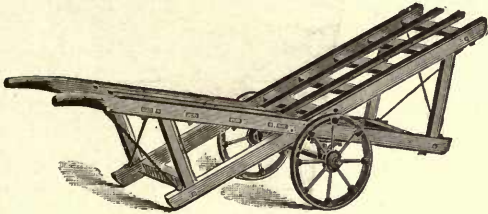


Fig. 583.

Size.	Description. Ft. In. Long. Wide.	Price.	Tel.
No. 1	6—24	\$33.00	Duluth
" 2	9—27	40.00	Helena
" 3	9—30	55.00	Cephas

Curved Baggage Barrow.

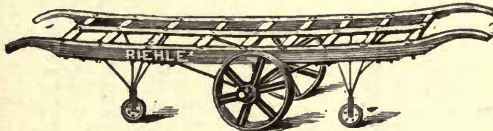


Fig. 524.

Size.	Size of Platform. Ft. In. Ft. In.	Price.	Tel.
No. 1	9—0 x 0—24	\$45.00	Gaol
" 2	11—0 x 0—28	50.00	Gape
" 3	13—0 x 0—30	60.00	Garb

N. B.—Special Trucks and appliances are made for customers according to their own designs, or sketches will be submitted for approval by Riehlé Bros. Testing Machine Co. Send for estimates and prices.

Express and Baggage Wagon.

Improved Pattern.

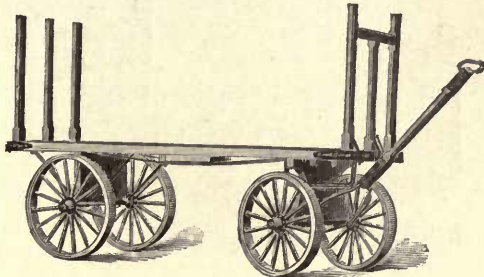


Fig. 563.

Size.	Description. Ft. In. Long. Wide.	Diam. of Front Wheels, Inches.	Diam. of Back Wheels, Inches.	Price.	Tel.
No. 1	10—40	28	31	\$100.00	Haddonfield

These wagons are extensively used by express companies and railroads. All material carefully selected. Thoroughly ironed and braced. Extra strong and durable. Baggage wagons furnished with wood wheels when desired.

Four Wheel Express Barrows.

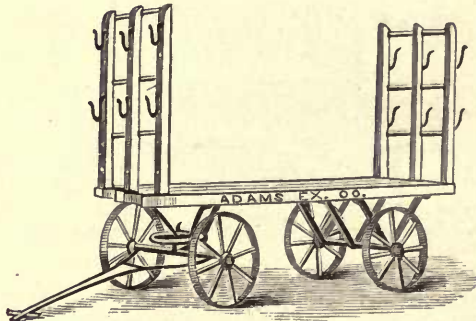


Fig. 525.

Extra Made. Very Strong, and with Braces.

Size.	Dimensions. Ft. In. long. wide.	Price. Half Ironed.	Price. Full Ironed.	Tel.
No. 1	8—24	\$80.00	\$95.00	Grow
" 2	10—24	115.00	125.00	Gustavus
" 3	12—28	140.00	150.00	Grass

N. B.—For Full Ironed Express Barrows prefix F to the telegraph word, viz :—Fgrow.

Special Sizes made to order.



### Heavy Express Trucks.

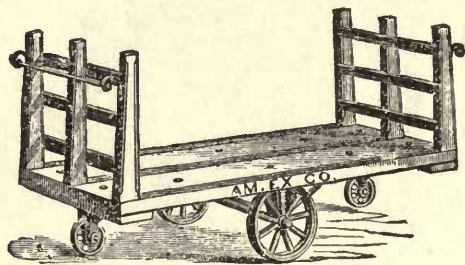


Fig. 526.

Size.	Size of Platform.		Diam. of Wheels. Inches.	Price.	Tel.
	Ft.	In.			
No. 1	5-0	x 2-0	13	\$32.00	Ginger

N. B.—This truck is used for various purposes, and is especially adapted to the work of Express Companies.

Special sizes made to order.

Note the sizes of the Iron Wheels that Riehlé Bros. Testing Machine Co. make.

### Dry Goods Truck.

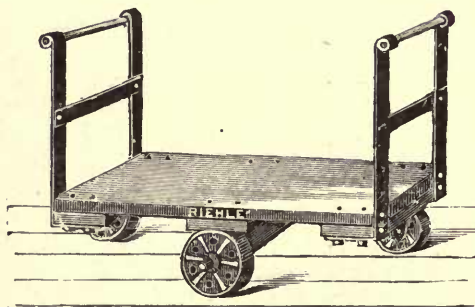


Fig. 527.

Extra strong. Four Iron Wheels. Made with two main fixed wheels, and two heavy castors. Adapted for the use of dry goods stores, warehouses, mills, etc.

Size.	Size of Platform.		Price.	Tel.
	Ft.	In.		
No. 0	3-6	x 2-0	\$20.00	Grist

No. 528.

This style of truck can be made, if ordered, with one end only, and with castors at each end instead of fixed wheels as represented above.

Price.	Tel.
\$16.00	Gastric

### Dry Goods Truck.

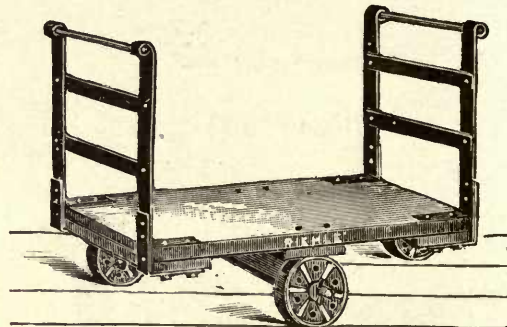


Fig. 529.

Extra strong. Four Iron Wheels. Made with two main fixed wheels, and two heavy castors. Adapted for the use of dry goods stores, warehouses, mills, etc.

Size.	Size of Platform.		Price.	Tel.
	Ft.	In.		
No. 1	3-6	x 2-0	\$24.00	Gateway

No. 530.

This style of truck can be made, if ordered, with one end only, and with castors at each end instead of fixed wheels as represented above.

Price.	Tel.
\$20.00	Garner

### Dry Goods Truck.

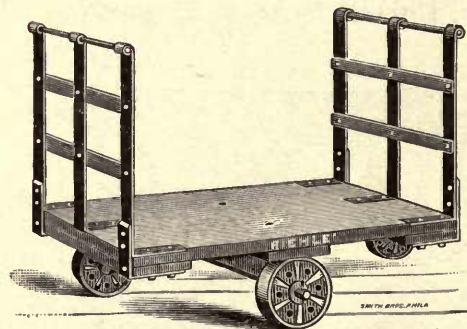


Fig. 531.

Extra strong. Four Iron Wheels. Made with two main fixed wheels and two heavy castors.

Size.	Size of Platform.		Price.	Tel.
	Ft.	In.		
No. 2	3-6	x 2-0	\$28.00	Gather



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Dry Goods Truck.

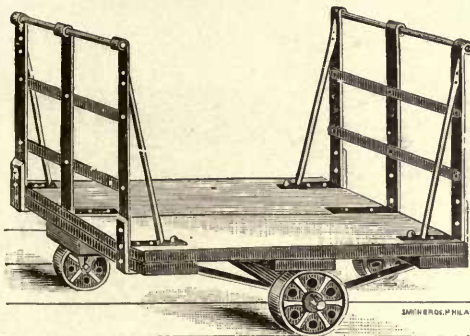


Fig. 532.

Extra heavy. Heavily ironed and braced.

Size.	Size of Platform.		Price.	Tel.
	Ft. In.	Ft. In.		
No. 3	4-0	2-2	\$35.00	Gaudy

No. 533.

This style of truck is also made with platform 3 feet 6 inches by 2 feet wide.

Price.	Tel.
\$30 00	Gauge

## Warehouse Trucks. (Two Bands.)

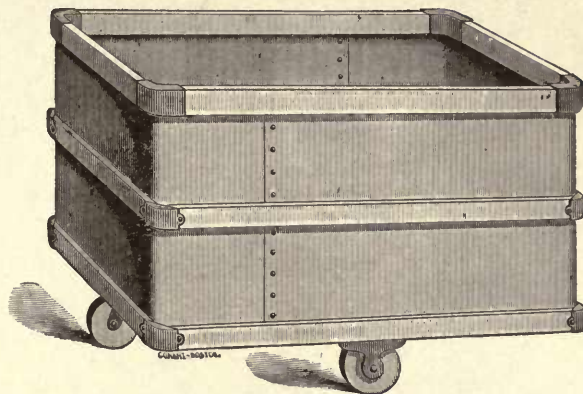


Fig. 584.  
DIMENSIONS.

SIZE.	LENGTH, INCHES.	WIDTH, INCHES.	DEPTH, INCHES.	PRICE.	TEL.
No. 1.	48	30	30	\$15 50	Advocate
" 2.	42	30	30	15 00	Adduce
" 3.	42	24	28	14 00	Adduct
" 4.	40	27	27	14 00	Adder
" 5.	40	15	24	12 00	Adenose
" 6.	38	21	28	13 25	Adhesive
" 7.	36	28	31	14 50	Adieu
" 8.	36	24	24	12 25	Adjoin
" 9.	36	20	26	12 50	Abbott
" 10.	36	20	18	11 00	Adjust
" 11.	36	18	24	12 00	Adure
" 12.	36	18	20	11 25	Advoke
" 13.	33	20	27	12 25	Adze
" 14.	32	18	18	11 00	Adward

## Warehouse Trucks. (Wood Corners. 3 Bands.)

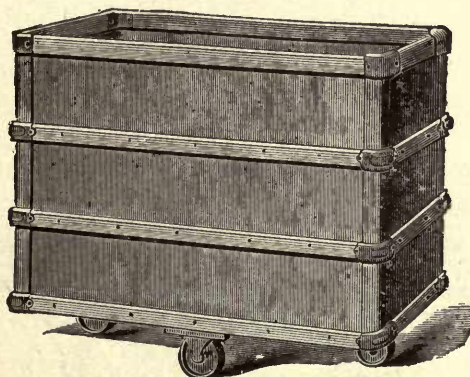


Fig. 590.  
DIMENSIONS.

SIZE.	LENGTH, INCHES.	WIDTH, INCHES.	DEPTH, INCHES.	PRICE.	TEL.
No. 1.	48	30	30	\$16 50	Acknow
" 2.	42	30	30	16 00	Acknowledge
" 3.	42	24	28	14 75	Acquaint
" 4.	40	27	27	14 75	Acme
" 5.	40	15	24	13 00	Acnode
" 6.	38	21	28	14 25	Acold
" 7.	36	28	31	15 50	Acute
" 8.	36	24	24	13 25	Actual
" 9.	36	20	26	13 50	Action
" 10.	36	20	18	12 00	Active
" 11.	36	18	24	13 00	Actor
" 12.	36	18	20	12 25	Adapt
" 13.	33	20	27	13 25	Add
" 14.	32	18	18	11 50	Addax

## Patent Fibre Warehouse Baskets.



Fig. 534.

Size.	Length. Inches.	Width. Inches.	Depth. Inches.	Price.	Tel.
00	48	30	30	\$36.00	Gorgeous
0	43	30	30	28.00	Gormand
1	39	27	27	24.00	Gosling
2	36	24	24	20.00	Gossip
3	32	22	21	18.00	Gothic
4	25	19	17	10.00	Gracious
5	22	15	12	6.00	Graft
6	24	12	10	5.00	Grandeur

N. B.—Sizes 00 to 4 mounted on iron wheels.

Rubber wheels furnished at additional cost.



Rattan Store Baskets.

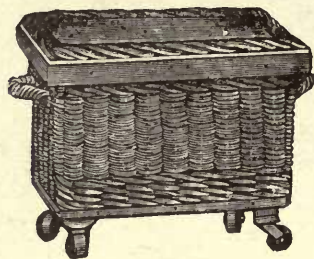


Fig. 535.

Style.	Length. Inches.	Width. Inches.	Depth. Inches.	Price.	Tel.
A	43	31	30	\$24.00	Grange
B	39	28	27	20.00	Gratitude
C	36	24	24	18.00	Gratulation
D	33	20	18	12.00	Gravitation
E	33	21	14	8.00	Grazing
F	28	18	14	6.00	Grawacke
G	25	15	10	5.00	Gyves

N. B.—Styles A, B, C and D are mounted on castors and iron bound. Styles A, B, C, D and E are framed on top.

“Star” Ham Truck.

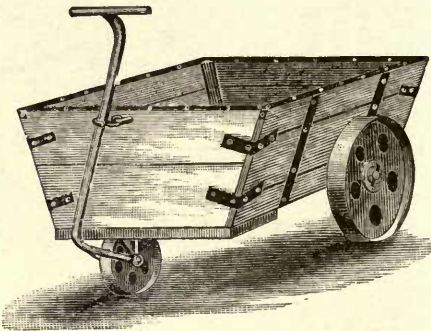


Fig. 537.

Turned axles; bored wheels; stout and strong; well ironed; 1 inch stuff; hard wood; finished with shellac.

Extreme Length, Ft. In.	Extreme Height, Ft. In.	Extreme Width, Ft. In.	Inside Measurement, Top,		Inside Measurement, Bottom.	
			Ft. In.	Ft. In.	Ft. In.	Ft. In.
4—3½	2—5	3—2	4—1	x 3	2—6	x 3—3
			Diameter Main Wheels.		Price.	Tel.
			In.			
No. 1	1—4¾	295	18		\$30.00	Schiller

Market House Truck.

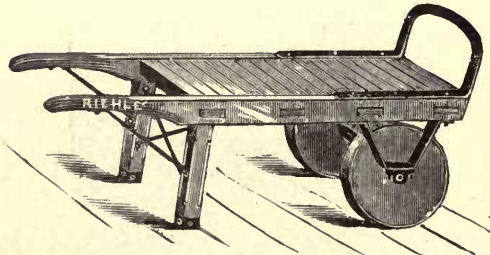


Fig. 536.

Extreme Length, Ft. In.	Extreme Width, Ft. In.	Extreme Height, Inches.	Diam. Wheels, Inches.	Diam. Face Inches.	Height of Nose Inches.	Length of Platform, Ft. In.	Width of Platform, Ft. In.
6—2	2—2	23	17	2	11	4—2	2—2
5—6	1—7	20	17	2	11	3—6	1—7
		Price		Tel.			
No. 1		\$35.00		Garment			
" 2		20.00		Vicksburg.			

N. B.—Labor-saving and convenient special trucks, designed and made for handling farmers' market packages. Send for drawings and estimates.

Pork Truck.

(Closed Top.)

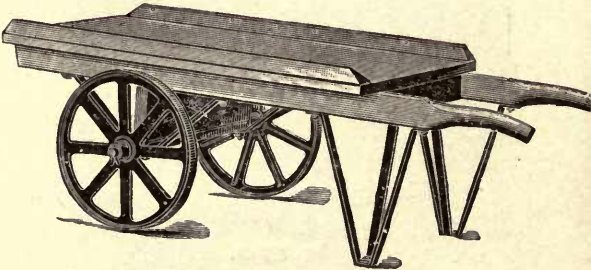


Fig. 564.

Size.	Size of Platform.		Diam. of Wheels, Inches.	Price.	Tel.
	Length.	Width.			
No. 1	52	32	20	\$25.00	Neversink

Made of the best seasoned lumber, wheels bored, axles turned.



Bacon Truck.

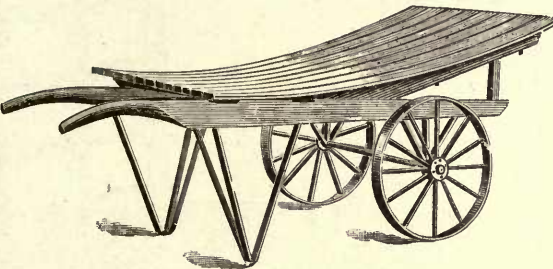


Fig. 538.

No. 1	Size of Platform.	Diam. of Wheels.	Price.	Tel.
	Inches.	Inches.		
	65x32	20	\$30.00	Gamble

N. B.—This truck can be made with either cast iron wheels or patent steel spoke wheels, as may be ordered.

Meat Truck.

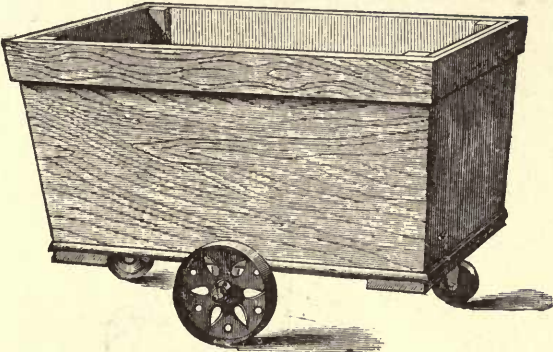


Fig. 565.

Size.	Dimensions.		Depth.	Price.	Tel.
	Length.	Width.			
No. 1	4—0	2—6	2—0	\$28.00	Tamaqua

This truck is built in a strong, durable, substantial manner. Axles turned and wheels bored.

Pork Truck.

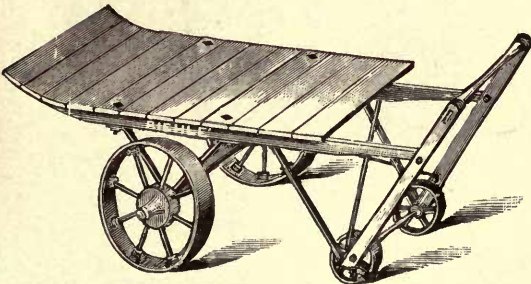


Fig. 539.

Size.	Size of Platform.		Price.	Tel.
	Ft. long.	Ft. wide.		
No. 1	5	3	\$40.00	Gladiator

“Philadelphia” Grocery Truck.

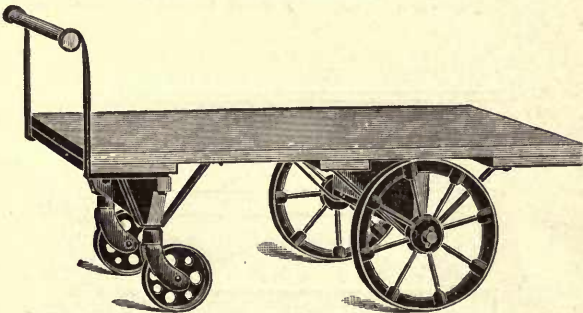


Fig. 566.

Size.	Size of Platform.		Diam. of Wheels.	Diam. of Castors.	Price.	Tel.
	Ft.	Ft.				
No. 1	3	5	12	6	\$28.00	Jacquette
" 2	3	5	18	8	32.00	Oscar

These improved trucks are well adapted for grocers' use. They can be turned easily in small space and in any direction, and the castor wheels in front effectually prevent overturning.



Leather Truck.

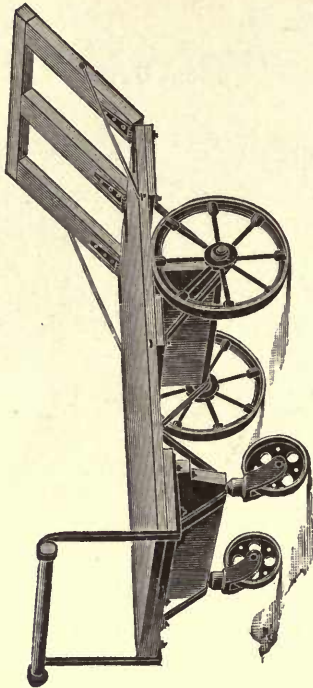


Fig. 567.

Size.	Size of Platform. Ft. Ft.	Diam. of Wheels. Inches.	Diam. of Castors. Inches.	Price.	Tel.
No. 1	3 x 5	18	8	\$35.00	Virginia

This truck has an extension tail gate two feet long, and is fastened with three heavy strap hinges and folds over flat on platform when not in use.

"Popular" Warehouse Truck.

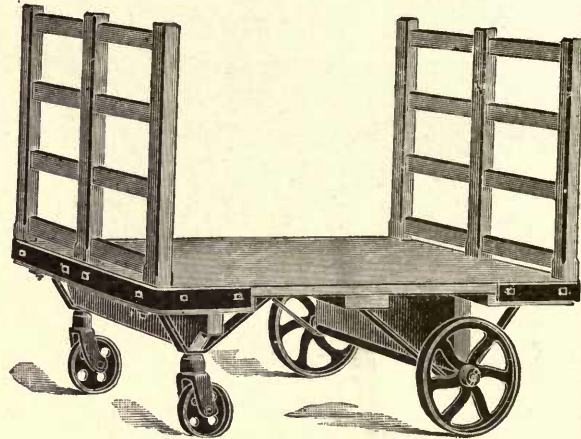


Fig. 568.

Size.	Size of Platform. Ft. Ft.	Diam. of Wheels. Inches.	Diam. of Castors. Inches.	Price.	Tel.
No. 1	3 x 4	12	6	\$34.00	Viorene

This truck is largely used for handling bags of salt, grain, seeds, etc. End racks fit in sockets and can be removed when desired.

Warehouse Platform Truck.

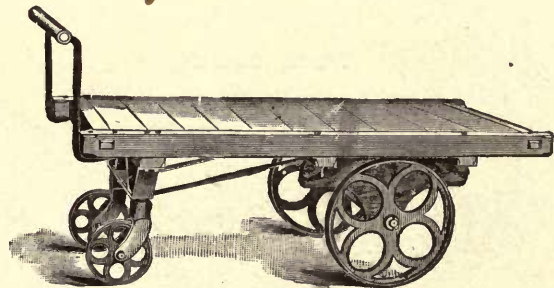


Fig. 540.

Size.	Size of Platform. Ft. Ft.	Size Over All. Ft. Ft.	Diam. of Wheels. Inches.	Diam. of Castors. Inches.	Price.	Tel.
No. 1	2 x 4	2 x 4 $\frac{1}{2}$	12	6	\$29.00	Grecian
" 5	3 x 4	3 x 4 $\frac{1}{2}$	12	6	32.00	Grenadier
" 6	2 $\frac{1}{2}$ x 5	2 $\frac{1}{2}$ x 5 $\frac{1}{2}$	12	6	32.00	Greyhound
" 8	3 x 5	3 x 5 $\frac{1}{2}$	12	6	33.00	Grievance
" 9	2 x 4	2 x 4 $\frac{1}{2}$	18	8	32.00	Grotto
" 13	2 $\frac{1}{2}$ x 4 $\frac{1}{2}$	2 $\frac{1}{2}$ x 4 $\frac{3}{4}$	18	8	35.00	Grunst
" 15	3 x 4	3 x 4 $\frac{1}{2}$	18	8	35.00	Guard
" 16	2 $\frac{1}{2}$ x 5	2 $\frac{1}{2}$ x 5 $\frac{1}{2}$	18	8	35.00	Gunnery
" 18	2 x 5	2 x 5 $\frac{1}{2}$	18	8	35.00	Gunning
" 19	2 x 6	2 x 6 $\frac{1}{2}$	18	8	35.00	Gerald
" 21	3 x 5	3 x 5 $\frac{1}{2}$	18	8	38.00	Gypsum

N. B.—Sizes 1, 5, 6 and 8 are adapted for ordinary work, and 9, 13, 15, 16, 18, 19 and 21 for very heavy work.

Improved Tannery and Leather Trucks.

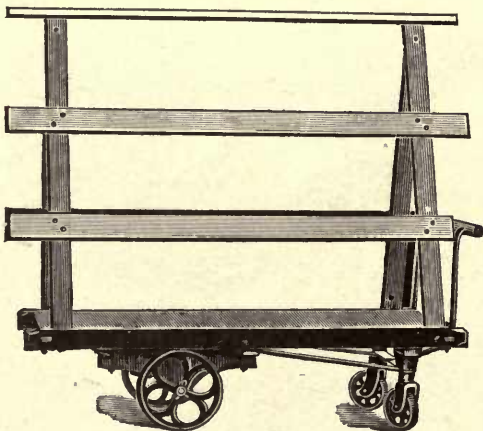


Fig. 586.

We make these trucks any height and mount them on any size platform. Made with any number of side bars to suit purchaser

Prices quoted upon application.



Marble and Stone Truck.

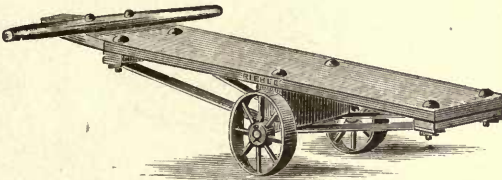


Fig. 541.

Ext'me Length	Ext'me Width	Ext. Height	Length of Handle.	Diam of Wheels.		Price.	Tel.
Ft.	Ins.	Ins.	Ft.	Ins.	In.		
9	18	21½	4	19½	2½	\$20.00	Gully

N. B.—This truck is strong and durable, and made in a very substantial manner, and is used by most of the prominent marble dealers.

Paper Dealer's Truck.



Fig. 543.

Very stout; six iron wheels; wheels bored and axles turned.

Extreme Length.	Extreme Height.	Extreme Width.	Price.	Tel.
Ft.	Ft. In.	Ft. In.		
3	3-6	1-10½	\$22.00	Genius

Paper Dealer's Horse.

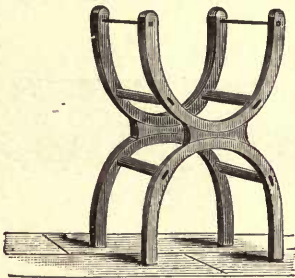


Fig. 542

Strong; well braced; durable.

Extreme Length at top.	Extreme Length at bottom.	Extreme Height.	Extreme Width.	Price.	Tel.
Ft. In.	Ft. In.	Ft. In.	Inches.		
1-8½	2-4	3-4½	14½	\$7.50	Germ

Riehlé Bros. Testing Machine Co. are sole agents for Clark's Exhaust Ventilating and Drying Fans. Illustrated price-lists furnished on application.

Paper Pulp Trucks.

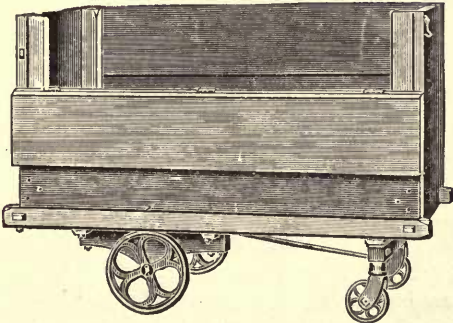


Fig. 585.

SIZE.	SIZE OF PLATFORM, FT. FT.	DIAM. OF WHEELS, INCHES.	DIAM. OF CASTERS, INCHES.	PRICE.	TEL.
No. 1.	3x5	12	6	\$40 00	Adfeear
" 2.	3x5	18	8	45 00	Affect

Special sizes made to order.



### Box Truck.

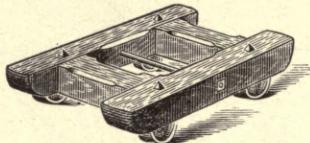


Fig. 544.

Extra heavy. Iron braces. Full sizes.  
Turned axles, bored wheels.

Size.	Dimensions.		Plain.	Braced.	Patented Rubber Wheels		Tel.
	Ft. In.	Ft. In.			Ex. Nett.		
No. 1	1-6	1-2	\$5.00	\$5.50	\$4.00		General
" 2	2-0	1-4	6.00	6.50	4.00		Greedy
" 3	2-6	2-0	7.00	7.75	4.00		Grab
" 4	2-0	1-4	(All Iron)		8.50		Godfrey

Telegraph names refer to plain truck; for braced trucks prefix B to the word, viz:—Bgeneral, and for rubbered wheels prefix R to the word, viz:—Rbgeneral for No. 1 truck.

### Lumber Truck.

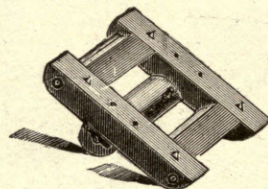


Fig. 546.

Iron axle running through the entire length of roller.  
Hard wood; strong and well-made.

Length, Inches.	Width, Inches.	Height, Inches.	Diam. of Roller, Inches.	Length of Roller, Inches.	Price.	Tel.
24	16	7	5	12	\$8.00	Gaunt

### Six Wheel Box Truck.

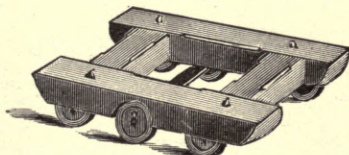


Fig. 545.

Extra heavy; iron braces; turned axles; bored wheels; hard wood; strong and substantial.

Length. Inches.	Width. Inches.	Height. Inches.	Price.	Tel.
30	18	5½	\$8.00	Gauze

### Press-Room Paper Truck.

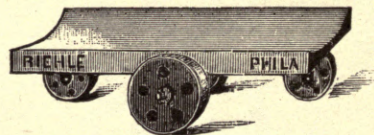


Fig. 547.

Extra heavy; turned axles and bored wheels.

Extreme Length. Inches.	Extreme Width. Inches.	Extreme Height. Inches.	Price.	Tel.
38	11½	9	\$15.00	Gash

N. B.—Riehlé Bros. Testing Machine Co. also make Special Trucks per order. Send for designs and estimates.

N. B.—This truck is very useful in carrying rolled paper to any part of the press-room.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Extension Frame Barrel Truck.

(Clark's Patent.)

### Paper Truck.

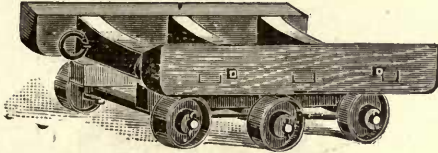


Fig. 569.

Size.	Dimensions. Ft. In. Ft. In.	Price	Tel.
No. 1	2—8x1—8	\$15.00	Nebraska

This is a very desirable truck for handling paper in rolls. It is strongly made, frame mortised; centre wheels being blocked gives a slight rock so truck can be turned easily. Wheels lored and axles turned.

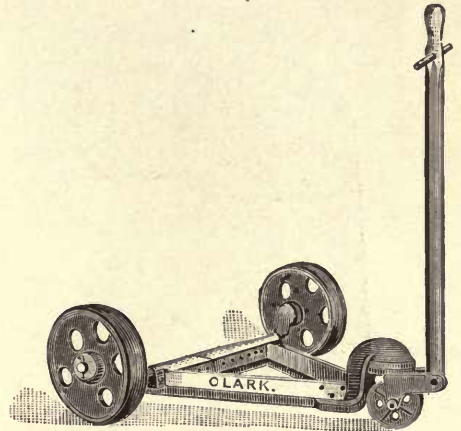


Fig. 571.

Size.	Capacity. Lbs.	Price with Iron Wheels.	Tel.
No. 1	800	\$9.00	Pottstown
" 2	1200	19.00	Maine
" 3	1700	24.00	Bath

These trucks have no equal for moving barrels of every description. It will be especially appreciated for moving open barrels of materials or liquid, as on it they can be moved in an upright position without spilling contents.

### Hogshead Truck.

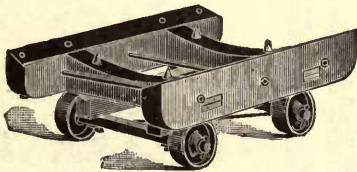


Fig. 570.

Size.	Dimensions. Ft. In. Ft. In.	Price.	Tel.
No. 1	2—0x1—4	\$9.00	Savannah
" 2	2—4x1—8	12.00	London

This is a very strong, durable truck, and useful for handling hogsheads, large casks, etc. Full ironed on top, axles cross-braced, frame 9½ inches high, side rails 4½x2½ inches, wheels bored and axles turned.

### Lap Truck.

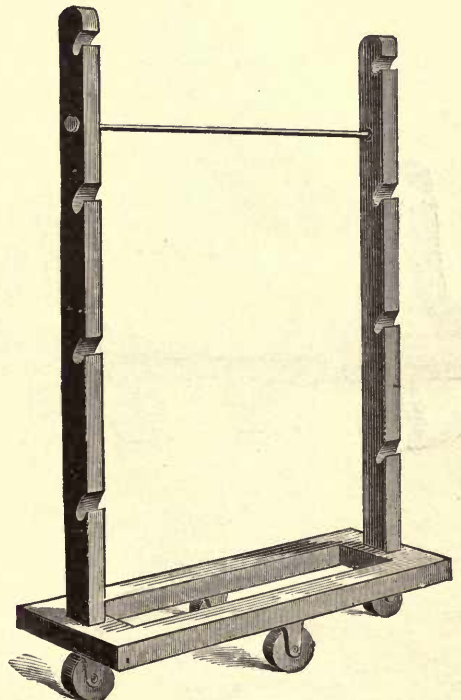


Fig. 572.

Size.	Capacity. Holding.	Price.	Tel.
No. 1	4—3 feet laps.	\$15.00	Albany
" 2	8—3 " "	18.00	Georgia

Special sizes made to order.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Cloth Truck.

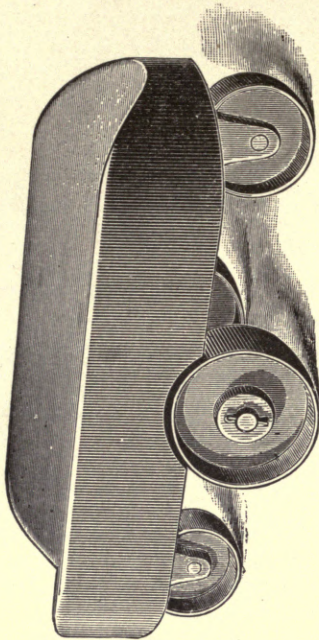


Fig. 573.

Size.	Length. Inches.	Width. Inches.	Price.	Tel.
No. 1	48	24	\$15.00	Kansas

Special sizes made to order.

## Contractor's and Builder's Truck.

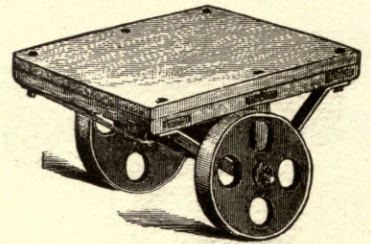


Fig. 548.

Turned axles; bored wheels; strong, well-made; heavily braced.

Extreme Length. Feet.	Extreme Height. Ft. In.	Extreme Width. Ft.	Diam. Wheels. Inches.	Price.	Tel.
3	2- $\frac{3}{4}$	2	18	\$25.00	Grows

N. B.—This truck is made for handling heavy iron girders, iron columns, stone, etc.

## Beam Truck.

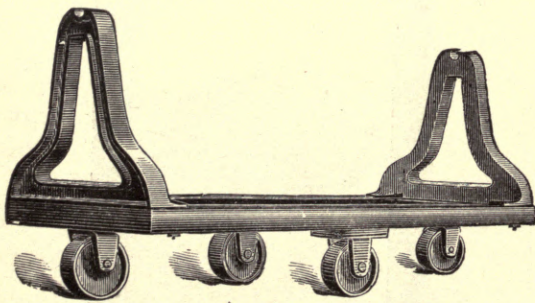


Fig. 574.

Size.	Extreme Length. Inches.	Extreme Width. Inches.	Price.	Tel.
No. 1	24	18	\$12.00	Glassboro
" 2	36	18	15.00	Hoboken

Special sizes made to order.

## SKIDS.

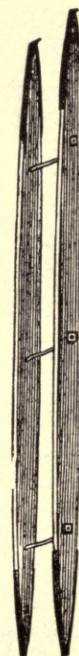


Fig. 549.

Size.	Description.	Price.	Tel.
No. 1	6 ft. long, 2 Iron Cross-Bars,	\$5.00	Gala
" 2	" " " "	5.50	Gadder
" 3	" " " "	6.50	Gable
" 4	" " " "	7.50	Gaffe
" 5	" " " "	8.50	Gaily

N. B.—Special sizes made to order.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Skids.

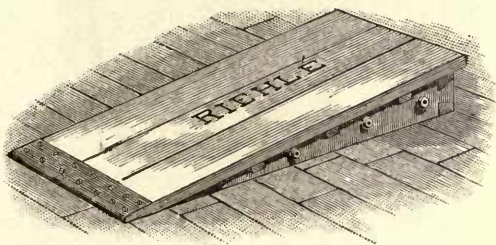


Fig. 575.

Size.	Length. Ft. In.	Width. Ft. In.	Height. Ft. In.	Price	Tel.
No. 1	6—0	3—0	1—0	\$15.00	Gabriel
" 2	10—0	4—0	1—4	20.00	Woodbury

Riehlé's trucks are made of well-seasoned lumber; all axles turned and wheels bored. Workmanship and finish unexcelled.

## Stove Truck.

(H. & D. Patent.)

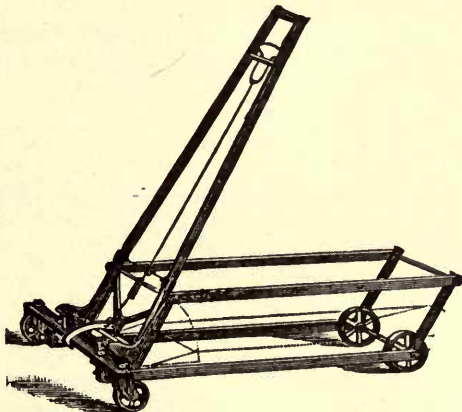


Fig. 576.

Size.	Length. Inches.	Height when Raised. Inches.	Height when Folded. Inches.	Price.	Tel.
No. 1.	30	11	5	\$10.00	Columbia

This truck is made in the best possible manner of malleable iron and steel, is simple in construction, convenient in operation, and will not get out of order.

## "Fidelity" Book Truck. (For Banks and other Financial Institutions.)

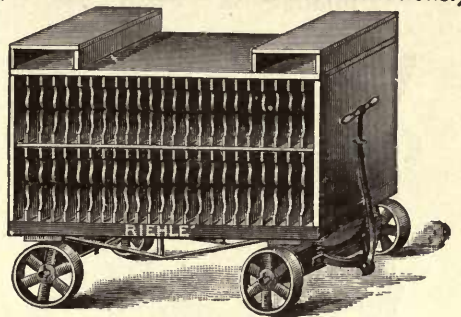


Fig. 551.

Price.....\$ Tel. Fidelity.

These Trucks are made of Pine or Hardwood, and finished to suit the taste of purchaser, and are built of the best materials and in a superior manner. The size varies with the number of books or cases required to be accommodated, and mounted on wheels, so they can be run into the Vault or Fire-Proof. In inviting estimates or inquiring for prices, observe the following points in every particular:—

Extreme Height.....  
 " Width.....  
 " Length.....  
 Number and size of shelves and partitions,  
 Material and finish required.....  
 Diameter of wheels, and probable weights  
 to be carried.....

These Trucks have turned axles and bored wheels, so that they run quietly and do not tear up floor; or if the floor of office is of tiling or skylight, Clark's patented rubber wheels are put on. The front axle vibrates so that the Truck can be turned like a wagon upon a short curve.

In use by many Trust & Insurance Companies in Phila. & elsewhere.

## Push Truck.

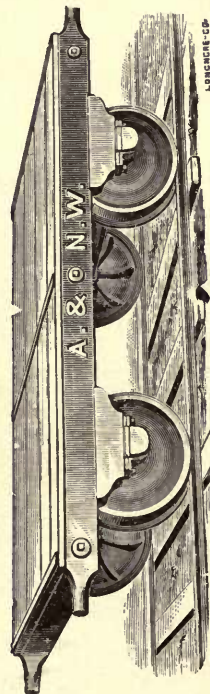


Fig. 578.

Size.	Platform. Ft. In.	Diam. of Wheels. In.	Capacity. Lbs.	Price.	Tel.
No 1	7—0x4—10	18	5000	\$100.00	Harrisburg

This is a complete little truck in all particulars. Wheels are fitted with clamp journal boxes. Special sizes made to order; estimates will be furnished on application.



"Philadelphia" Push Cart.

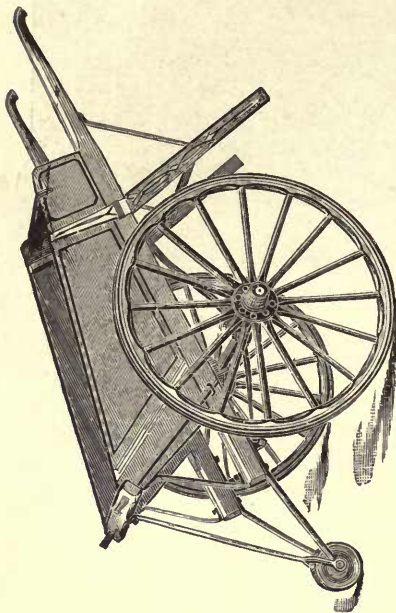


Fig. 579.

Size.	Size of Bed.	Depth at Dash.	Depth Front.	Price.	Tel.
Ft.	In.	Ft.	In.		
No.1	3-1x1-8	16	7½	\$50.00	Birdsboro

This is a very strong, substantial cart, thoroughly well made and highly finished.

Ash Box Trucks.



Fig. 580.

Size.	Dimensions.			Diam. of	Capacity.	Price.	Tel.
	Length.	Width.	Depth.	Wheels.	Lbs. of coal.		
Inches.	Inches.	Inches.	Inches.	Inches.			
No. 1	36	30	30	12	1500	\$70.00	Akron

These trucks can be made in any size and capacity desired. Prices upon application.

Improved Soap Frame.

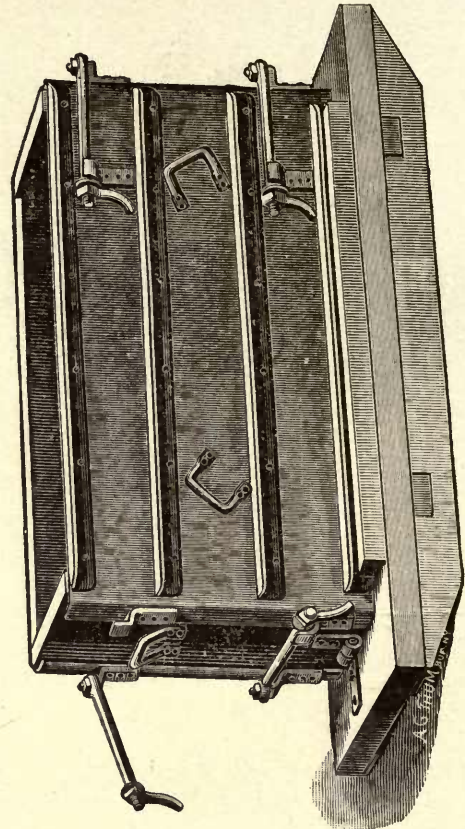


Fig. 581.

For description and prices see page

Improved Soap Frame.

THE Improved Soap Frame, as illustrated on page is made in a good, strong, substantial manner, and guaranteed to do the work required of it in a satisfactory manner.

The sides consist of sheet iron, heavily braced with angle irons so that there can be no bulging nor buckling of the sides. The ends are attached to the bottom in such manner as to be easily detached. The whole is firmly bound together by hinged rods provided with fly nuts. The Frames can be set up or knocked down in a few moments. Two bottoms are supplied with each set of sides and ends, so that the soap can remain on one bottom for cutting while the other bottom and frame are ready to receive a fresh charge of soap.

Many soap makers prefer the Frames without wheels, handling the frame; on specially constructed trucks. We can, however, furnish them with wheels if desired.

Size.	Capacity.	Inside Depth.	Inside Length.	Outside Height.	Price without Wheels.	Price with Wheels.	Tel.
Inches.	Lbs.	Inches.	Inches.	Inches.			
No.1	1000	14	56	42	\$40.00	\$45.00	Alabama

Telegraph name refers to frames without wheels.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Machine-Shop Truck.

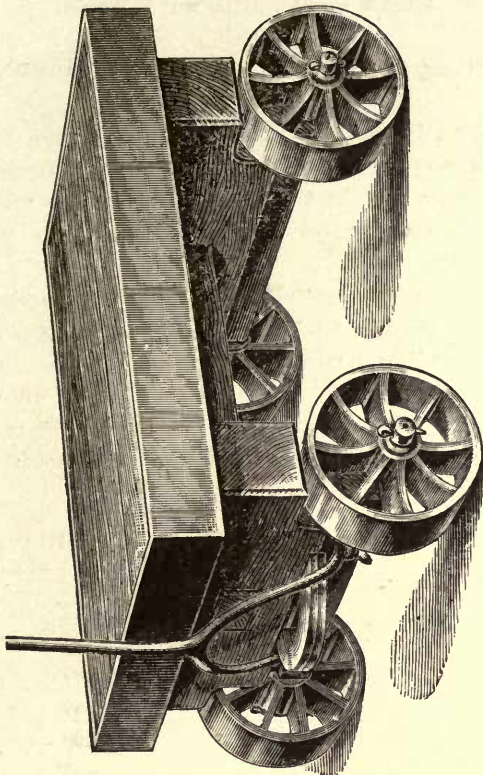


Fig. 582.

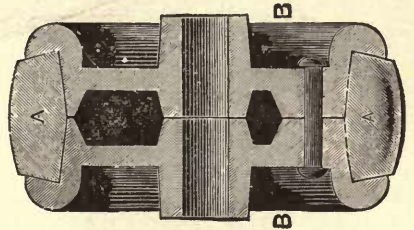
For description and sizes see page

## Machine-Shop Truck.

HAVING had many calls for an extra heavy truck especially adapted for machine and railroad shops and foundry use, we have finally decided to supply the demand, and are now prepared to offer the truck as illustrated on page These trucks are made of the best materials, and with a view to great strength and durability. The platform is of heavy, hardwood planks, bolted to a continuous piece of angle iron running around the outer edge. Axles are turned and wheels bored. We have one size in stock, but can make special sizes if desired.

Size.	Size of Platform, Inches.	Price.	rel.
No. 1	30 x 40	\$70.00	Arkansas

## Clark's Patent Rubber Wheels.

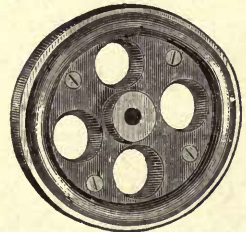


These Wheels are unrivalled for DURABILITY, SIMPLICITY and CHEAPNESS. They are perfectly noiseless, and do not wear the floors perceptibly; can be used on wood, brick and concrete floors with great saving. They are particularly adapted for all kinds of mill and warehouse work, and are greatly appreciated in Hotels, Banks and Hospitals, where noise is troublesome.

They are composed of two compressing metallic disks, which are provided with a section of hub, peripheral flange, and an annular rim of vulcanized rubber, which is mounted on the shoulders of the disk and firmly compressed between their flanges by means of screws, making it easy to replace worn-out rubbers, and yet rendering it utterly impossible for the rubbers to slip off, as was the case with the old methods, which were as follows:—One way consisted of springing a ring of rubber on to a grooved wheel; but a movement of the wheel sideways would spring the rubber off as easily as it was put on. The other method consisted in vulcanizing the rubber on; but on being used, the rubber would become loose from the wheel. CLARK'S PATENT RUBBER WHEEL overcomes these difficulties, it being so simple that any person, with little trouble, can replace worn-out rubbers, making the wheels as good as new.

## Partial Price List of Rubber Wheels.

NO NOISE! NO WEARING OF FLOORS!



Diam. of Wheel. Inches.	Rubber Face. Inches.	Through Hub. Inches.	Bore of Wheels in Stock. Inches.	Plain Wheels, per Doz. Price.
2½	¾	1½	5/16	\$5.50
3	¾	1½	5/16	8.00
4	1	2	5/16	11.50
5	1	2½	5/16	16.00
6	1½	2½	and	23.30
7	1½	2½	and	29.30
8	1½	2½	and	36.00
9	1½	3	and	51.00
10	1½	3	and	64.00
11	1½	3	and	70.32
12	1½	3	and	74.40
14	1½	3	and	99.00
15	1½	3½	and	106.00
16	1½	3½	and	111.96
20	1½	3½	and	145.00
25	2½	3½	and	232.20

Full Illustrated Price List of Rubber Wheels  
Castors, etc., furnished on application



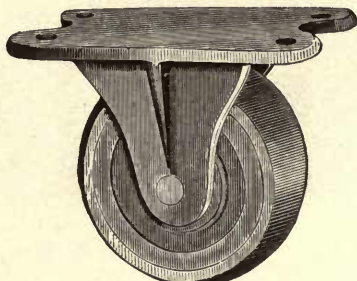
# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Rubber Wheels with Stands.

All ready to bolt to the bottom of boxes or baskets.

This form of Stand is best adapted for small boxes or baskets.

No. 10.



Price per Dozen.

Diameter of Wheel, Inches.	
2 1/8	\$ 5.00
2 1/2	7.00
3	11.00
4	14.00

Larger wheels put in this style of stand when ordered.

### Price List of Extra Rubbers.

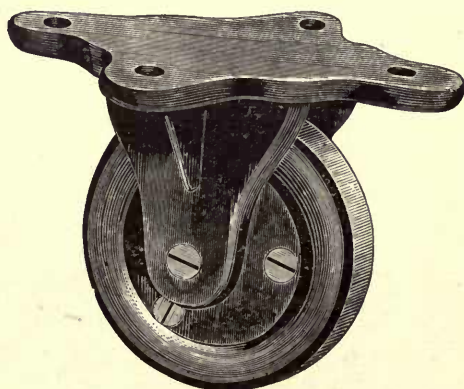
Diameter, Inches.	Price, Each.	Diameter, Inches.	Price, Each.
1 1-16	\$ .04	7	\$ .85
1 5-16	.06	8	1.00
1 9-16	.08	9	1.50
1 3/8	.10	10	1.70
2 1/8	.12	11	1.95
2 1/2	.17	12	2.10
3	.25	14	2.72
4	.40	16	3.50
5	.55	25	6.80
6	.70		

Trucks of any design and for any purpose made to order.

## Rubber Wheels with Stands.

This form of Stand is best adapted for heavy work.

No. 11.



Price per Dozen.

Diameter of Wheel, Inches.	
2 1/8	\$ 5.50
2 1/2	7.25
3	11.75
4	14.75
5	20.00
6	31.68
7	40.44
8	48.60
9	66.96
10	84.60

Special trucks and appliances are made for customers according to their own designs. Send for estimates and prices.

## Extra Heavy Rubber Wheels.

### Strong Castings, Thick Rubbers, Durable

THESE goods are not intended to supersede the common-weight goods, but are for special places, where the quantity of stock moved is very heavy, and where the floors are extremely rough and uneven.

They can be used upon two-wheeled hand trucks, heavy platform trucks, box trucks, and dry goods trucks when run upon elevators or sidewalks.

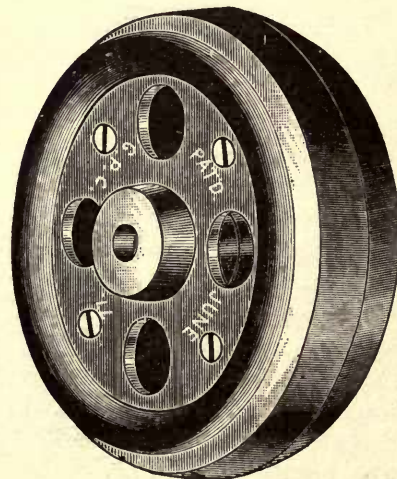
They also possess all the advantages over other parties' rubber wheels which are claimed for our common-weight goods, which we also keep constantly in stock.

### PRICE-LIST OF EXTRA RUBBERS FOR EXTRA HEAVY WHEELS.

Diam. Inches.	Price, Each.
4	\$ .55
5	.85
6	1.40
7	1.60
8	1.95
9	2.75

## Extra Heavy Rubber Wheels.

No. 75



Diam. of Wheels, Inches.	Rubber Faces, Inches.	Through Hub, Inches.	Bore of Wheels in Stock, Inches.	Price, Plain Wheels, Per Doz.
4	1 1/2	2 3/4	1/2	\$14.40
5	1 5/8	3 1/8	1/2	21.00
6	1 7/8	3 1/4	5/8 and 7/8	31.20
7	1 3/4	3 1/2	5/8 and 7/8	35.40
8	1 3/4	3 1/2	5/8 and 7/8	45.00
9	2	4	5/8 and 7/8	58.80

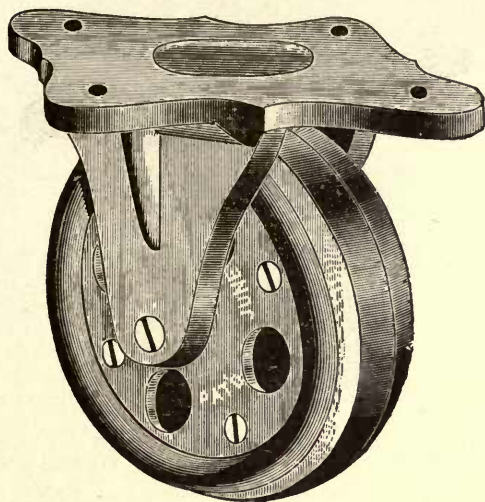
Riehle's trucks are made of well-seasoned lumber. All axles turned and wheels bored.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Extra Heavy Rubber Wheels, with Stands.

No. 81.



Diam. of Wheel. Inches.	Price per Doz
4 . . . . .	\$19.20
5 . . . . .	28.80
6 . . . . .	38.40
7 . . . . .	46.80
8 . . . . .	55.20
9 . . . . .	74.40

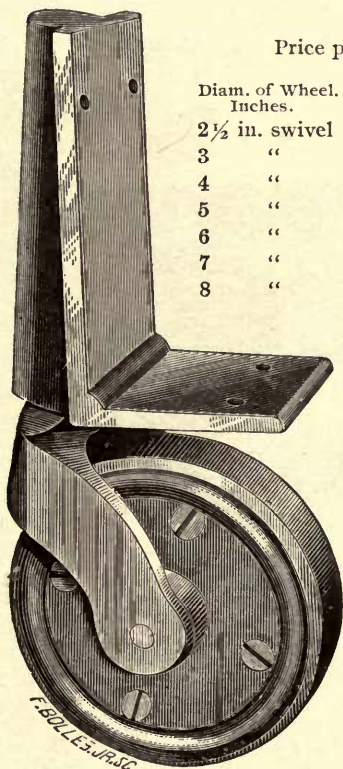
Riehlé's trucks are made of the best materials, and are strong and substantial.

## Rubber Wheel Bracket Castors.

No. 9.

Price per Dozen.

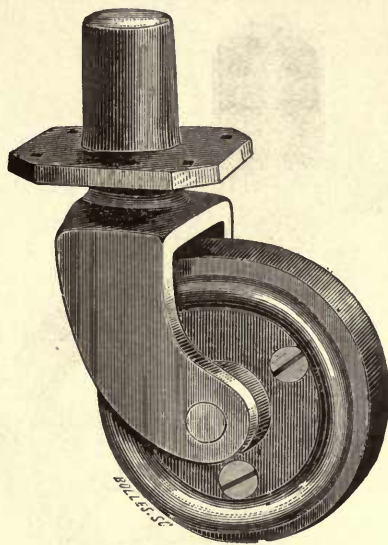
Diam. of Wheel. Inches.		
2½ in. swivel . . . . .	\$12.00	
3 " . . . . .	14.50	
4 " . . . . .	17.00	
5 " . . . . .	21.00	
6 " . . . . .	36.12	
7 " . . . . .	44.00	
8 " . . . . .	51.00	



Illustrated Testing Machine Price-Lists furnished upon application, also Catalogues of Wheelbarrows and Contractors' requirements.

## Short Stem Rubber Wheel Castor.

No. 6.



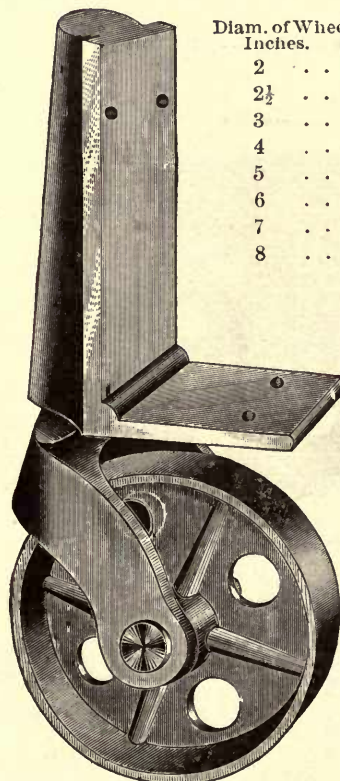
Diameter of Wheel. Inches.	Price per Dozen.
2½ . . . . .	\$ 5.00
2½ . . . . .	8.00
3 . . . . .	11.00
4 . . . . .	15.00
5 . . . . .	20.00
6 . . . . .	34.00
7 . . . . .	42.00
8 . . . . .	48.00

The Robie Patent Screw Jack, manufactured by the Riehlé Brothers Testing Machine Company, is the best lifting jack in the world for all purposes.

## Iron Wheel Bracket Castors.

No. 52.

Diam. of Wheel. Inches.	Price per Doz.
2 . . . . .	\$4.75
2½ . . . . .	6.50
3 . . . . .	8.75
4 . . . . .	12.00
5 . . . . .	16.00
6 . . . . .	23.00
7 . . . . .	27.00
8 . . . . .	34.00



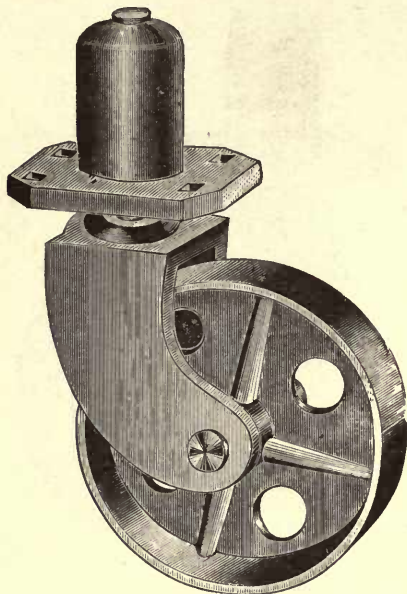
Illustrated Catalogues of trucks furnished upon application, also price-lists of mill supplies.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## Short Stem Iron Wheel Castors.

No. 54.

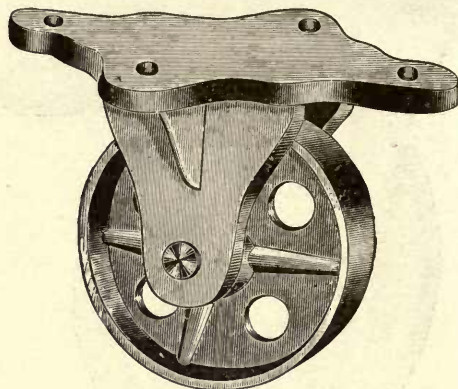


Diam. of Wheel. Inches.	Price per Doz.
2 . . . . .	\$4.50
2½ . . . . .	6.00
3 . . . . .	8.80
4 . . . . .	11.00
5 . . . . .	15.00
6 . . . . .	22.00
7 . . . . .	26.00
8 . . . . .	33.00

We are prepared to make trucks of any size, style, and for any purpose required. If desired will make and submit drawings.

## Iron Wheels, with Stands.

No. 58.

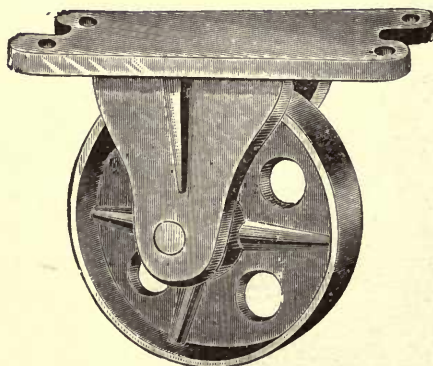


Diam. of Wheel. Inches.	Price per Doz.
2 . . . . .	\$3.50
2½ . . . . .	4.50
3 . . . . .	6.00
4 . . . . .	8.00
5 . . . . .	12.00
6 . . . . .	20.00
7 . . . . .	28.00
8 . . . . .	35.00
9 . . . . .	40.50

Coal, dirt, and ash-barrows of all sizes and capacities. Send for price list.

## Iron Wheels, with Stands.

No. 56.

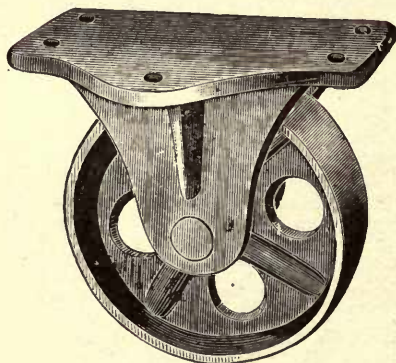


Diam. of Wheel. Inches.	Price per Doz.
2 . . . . .	\$3.50
2½ . . . . .	4.50
3 . . . . .	6.00
4 . . . . .	8.00
5 . . . . .	12.00
6 . . . . .	20.00

This form of stand is most frequently used for mounting store and factory trucks. All ready to bolt on,

## Iron Wheels in Stands.

No. 45.



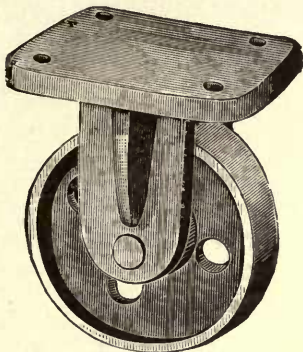
Diam. of Wheel. Inches.	Price per Doz.
2 . . . . .	\$3.50
2½ . . . . .	4.50
3 . . . . .	6.00
4 . . . . .	8.00
5 . . . . .	12.00
6 . . . . .	20.00
7 . . . . .	28.00
8 . . . . .	35.00
9 . . . . .	40.50



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA

## Iron Wheels in Stands.

No. 44.



Diam. of Wheel. Inches.	Top of Stand. Inches.	Price per Doz
3½	3¼ x 3¼	\$7.00

This style of stand is well adapted for use where the area of surface for attachment is small.

## DIMENSIONS OF CAST IRON BORED WHEELS—PLAIN.

Symbol.	Diam.		Face.		Hub.		Through Hub.	Weight Lbs.	Telegraph.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.			
	3	1½	1	1	1½			Folly	
S.	3½	1¾	1½	¾	¾			Zeal	
"2 Box."	3¾	1¾	1½	1¾	3½			Zealous	
"1 Box."	3¾	1¾	1½	1¾	2			Zebra	
C.	3¾	¾	1	1	1½			Zenith	
O. C.	4	1½	1	1¾	1½			Zephyr	
G.	4	1¾	1½	1¾	2½			Zero	
S. C.	4	2	1½	2	4			Zest	
S. I.	4½	1¾	1½	2	4			Zootographer	
W.	4¾	1½	1½	1¾	3½			Zone	
L.	5	1½	1¾	1¾	3½			Zoophyte	
S. D.	5½	3	1¾	2	7			Zouave	
H.	5¾	1½	2	2	4			Zymotic	
O. B.	5¾	1	1½	1½	3½			Zany	
N.	6	2½	2	2¾	7½			Zealot	
T.	6	1½	1¾	1¾	5½			Zebu	
F.	6	1¾	1½	1¾	3½			Zemindar	
No. 8.	6	1¾	1½	1½	5½			Zigzag	
A. G.	6½	3½	2	3¾	13			Flood	
1 L.	7	1¾	1¾	1¾	6½			Zinc	
1 W. H.	7½	1¾	1¾	1¾	7			Zincography	
2 W. H.	7½	2¾	2	2¾	9½			Zoographer	
Star.	8	2	2½	2¾	8½			Zoological	
• • •	8½	3½	2	2¾	13			Zoography	
No. 3.	8½	2½	2½	2¾	12½			Zoonomy	
U. S.	9	2½	2½	2¾	14			Flash	

Symbol.	Diam.		Face.		Hub.		Through Hub.	Weight Lbs.	Telegraph.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.			
R. L.	9½	4	3½	3½	29			Flare	
4 W. H.	10	4½	2	4½	15			Zootomy	
5 and 6, W. H.	11	3	2½	2¾	20			Zymology	
3 c.	12	2½		2¾	25			Fly	
E.	13¾	2	2½	2¾	22			Zaleski	
K.	13¾	4	3	3½	38½			Flat	
4 C.	17	3		3	42			Zannore	
B. O.	17¾	2¾	2½	2¾	30			Zarah	
R. 7.	18	3	2¾	3½	52			Zard	
O. Wr't Spokes	19¾	2½	2½	4½	62½			Zavalza	
Wr't Iron Spokes.	24	3 4''	core 4		49			Zeagler	

## DIMENSIONS OF CAST IRON BORED FLANGE WHEELS.

Symbol.	Diam.		Face.		Flange Hub.		Through Hub.	Weight Lbs.	Telegraph.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.			
	4	1	¾	1¾	1	3½		Folk	
H.	6	2½	¾	2½	2½	11		Zeandale	
P. T.	7½	1¾	¾	1¾	2¾	12		Zearing	
C.	7	2	¾	2½	2½	13		Zediker	
S. 4.	8	2	¾	2¾	3¾	23		Zeeland	
S.	9	1½	¾	2	2½	27		Zehnre	
1254	10	2½	¾	2½	3¾	30		Zelienople	
O.	11	2¾	¾	2¾	2½	31		Zellwood	
R. R.	13½	3¾	1	3	3½	51		Zigler	
	16	3½	1½	4½	4¾	71		Fold	
	16	1¾		3	4	49		Fancy	

## CASTER WHEELS AND STANDS.

Symbol.		Diam.		Face.		Total.		Weight.		Lbs.		Telegraph.
		Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	
		2½	3	¾	¾	2½	1¾	4	3	3½	7½	Peck
		3	3¾	¾	¾	4	3	3½	7½	3½	6	Pedal
		4	4	1½	1½	5	4	4	4	4	4	Pepper
		4	4	1½	1½	5	4	4	4	4	4	Pecan
		4	4	2	2	6	5	5	5	5	5	Pearl
		4	4	2	2	6	5	5	5	5	5	Zunbro
		4	4	2	2	6	5	5	5	5	5	Peak
		4	4	2	2	6	5	5	5	5	5	Peel
		4	4	2	2	6	5	5	5	5	5	Peasant
		4	4	2	2	6	5	5	5	5	5	Ziring
		4	4	2	2	6	5	5	5	5	5	Zilwaukee
		4	4	2	2	6	5	5	5	5	5	Palmyra
		4	4	2	2	6	5	5	5	5	5	Ambler
		4	4	2	2	6	5	5	5	5	5	Pending

## WHEELS IN SAME.

Symbol.		Diam.		Face.		Total.		Weight.		Lbs.		Telegraph.
		Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	
		2½	3	¾	¾	2½	1¾	4	3	3½	7½	Peck
		3	3¾	¾	¾	4	3	3½	7½	3½	6	Pedal
		4	4	1½	1½	5	4	4	4	4	4	Pepper
		4	4	1½	1½	5	4	4	4	4	4	Pecan
		4	4	2	2	6	5	5	5	5	5	Pearl
		4	4	2	2	6	5	5	5	5	5	Zunbro
		4	4	2	2	6	5	5	5	5	5	Peak
		4	4	2	2	6	5	5	5	5	5	Peel
		4	4	2	2	6	5	5	5	5	5	Peasant
		4	4	2	2	6	5	5	5	5	5	Ziring
		4	4	2	2	6	5	5	5	5	5	Zilwaukee
		4	4	2	2	6	5	5	5	5	5	Palmyra
		4	4	2	2	6	5	5	5	5	5	Ambler
		4	4	2	2	6	5	5	5	5	5	Pending

## CASTERS.

Symbol.		Diam.		Base		Height.		Weight.		Lbs.		Telegraph.
		Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	
		5	5	2	2	3	3	5	5	5	5	17.
		5	5	2	2	3	3	5	5	5	5	17.
		6	6	2½	2½	4	4	6	6	6	6	C. S. Swivel.
		6	6	2½	2½	4	4	6	6	6	6	S. M.
		6	6	2½	2½	4	4	6	6	6	6	O.
		6	6	2½	2½	4	4	6	6	6	6	S. C.
		6	6	2½	2½	4	4	6	6	6	6	N. O.
		6	6	2½	2½	4	4	6	6	6	6	24.
		6	6	2½	2½	4	4	6	6	6	6	S. M.
		6	6	2½	2½	4	4	6	6	6	6	2.
		6	6	2½	2½	4	4	6	6	6	6	L.
		6	6	2½	2½	4	4	6	6	6	6	5 L.
		6	6	2½	2½	4	4	6	6	6	6	5 C.
		6	6	2½	2½	4	4	6	6	6	6	2½.



CASTERS:

Symbol.	Diam. of Base in Ins.	Height, Ins.
W. B. S.		
Anti-Fric. 9	$5\frac{1}{2}$	$6\frac{3}{4}$
H.	$5\frac{1}{2}$	$7\frac{1}{2}$
H. 11.	$6\frac{1}{2} \times 5\frac{1}{2}$	$6\frac{1}{2}$
G. T. Swivel.		9
L. 8.	$6\frac{3}{4} \times 6\frac{1}{4}$	7
6 L.	$5\frac{1}{2}$	$7\frac{3}{8}$
6 C.	$5\frac{1}{2}$	7
L. 11.	$6\frac{5}{8} \times 6\frac{3}{8}$	$6\frac{3}{4}$
H. C.	$7\frac{1}{2} \times 6$	$13\frac{1}{4}$
H.	$7 \times 4$	$8\frac{1}{4}$
1 [].	$7 \times 7$	$9\frac{1}{4}$
No. 1 Sq. Base.	$5 \times 5$	9
U. S. Swivel.	$10\frac{1}{2}$	$10\frac{1}{2}$

WHEELS IN SAME.

Symbol.	Diam. Ins.	Face. Ins.	Total Weight. Lbs.	Telegraph.
H.	$5\frac{5}{8}$	$1\frac{1}{4}$	14	Penalty
H.	$5\frac{5}{8}$	$1\frac{1}{2}$	$12\frac{1}{4}$	Zirizicuars
H.	$5\frac{5}{8}$	$1\frac{1}{2}$	$13\frac{1}{2}$	Zumwalt
F.	6	$1\frac{3}{4}$	10	Perfect
No. 8.	6	$1\frac{1}{2}$	10	Zurich
McNeely.	6	$2\frac{1}{2}$	$18\frac{1}{2}$	Ardmore
McNeely.	6	$2\frac{1}{2}$	18	Pittston
N.	6	$2\frac{1}{4}$	$12\frac{1}{2}$	Zuni
F.	6	$1\frac{3}{4}$	19	Prospect
I. L.	7	$1\frac{3}{4}$	$14\frac{1}{2}$	Prime
Star.	8	$1\frac{7}{8}$	21	Pen
Star.	8	2	21	Zionsville
U. S.	9	2	38	Zwingle

CASTER WHEELS AND STANDS.

Tile Truck.

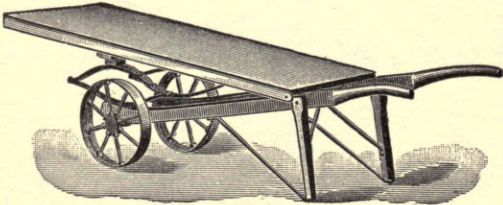


Fig. 589.

SIZE.	SIZE OF PLATFORM. INS. INS.	PRICE.	TEL.
No. 1.	28x72	\$25 00	Conrad

These trucks are designed to carry tile from the machine to the drying sheds.

Butter and Cheese Trucks.

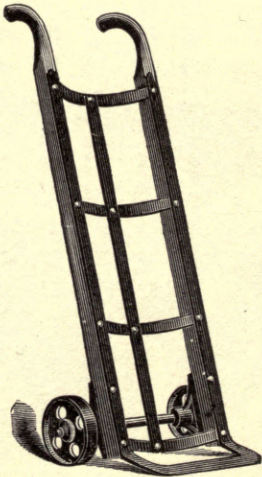


Fig. 590.

SIZE	LENGTH OF HANDLES, FT. IN.	WIDTH, FT. IN.	DIAM. OF WHEELS, INCHES.	PRICE.	TEL.
No. 1.	4 6	1 4	$7\frac{3}{4}$	\$12 00	Cyril
No. 2.	4 9	1 9	$7\frac{3}{4}$	15 00	Cyrus

These trucks are built in a good, strong, substantial manner. The wood is of well-seasoned hickory; the wheels bored and axle turned; the four curved iron cross bars are riveted to centre strap.



## SUPPLY DEPARTMENT.

### DIRT BARROWS.

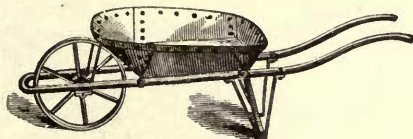


Fig. 1000.

- SIZE.  
No. 4. With tray, made of No. 16 steel, holding 3 cubic ft. of earth. Weight of barrow, 65 lbs.  
Telegraph, Adams. Price, \$10 75
- No. 4½. With tray, made of No. 14 steel, same size as No. 4.  
Weight of barrow, 70 lbs.  
Telegraph, Alexander. Price, \$11 50
- No. 5. With tray, made of No. 14 steel, holding 4 cubic ft. of earth. Weight of barrow, 80 lbs.  
Telegraph, Bond. Price, \$13 50
- No. 6. With tray, made of No. 14 steel, holding 5 cubic ft. of earth, or 225 lbs. of coal; adapted for same use as No. 5, and as a small coal barrow. Weight of barrow, 85 lbs.  
Telegraph, Boone. Price, \$15 00

### DIRT BARROWS.

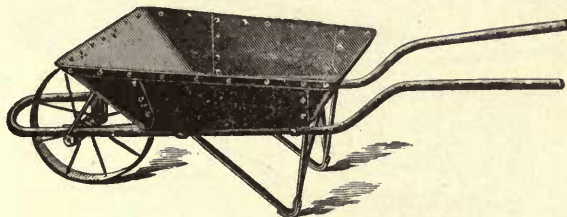


Fig. 1002.

- No. 13. Capacity, 3 cubic ft., 27 in. wide, 16 in. wheel, tray of No. 16 steel; weight, 70 lbs.  
Telegraph, Brown. Price, \$10 75
- No. 14. Capacity, 4 cubic ft., 28 in. wide, 16 in. wheel, tray of No. 16 steel; weight, 77 lbs.  
Telegraph, Bureau. Price, \$12 50
- No. 15. Capacity, 5 cubic ft., 30 in. wide, 16 in. wheel, tray of No. 16 steel; weight, 82 lbs.  
Telegraph, Calhoun. Price, \$14 50

### COAL BARROWS.

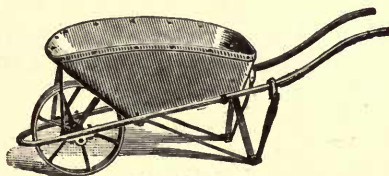


Fig. 1001.

- Size A. With tray holding 325 lbs. of coal; greatest width of tray, 30 in. Weight of barrow, 135 lbs.  
Telegraph, Carroll. Price, \$26 00
- Size B. With tray holding 400 lbs. of coal; greatest width of tray, 36 in. Weight of barrow, 145 lbs.  
Telegraph, Cass. Price, \$29 00
- Size C. With tray holding 260 lbs. of coal; greatest width of tray, 25 in.; especially designed for use in coal bunkers. Weight of barrow, 135 lbs.  
Telegraph, Champaign. Price, \$26 00
- Size D. With tray holding 300 lbs. of coal. Weight of barrow, 98 lbs.  
Telegraph, Christian. Price, \$18 00
- Size D, No. 2. With tray holding 350 lbs. of coal. Weight of barrow, 100 lbs.  
Telegraph, Calvin. Price, \$20 00
- Size E. With tray holding 4 bushels of coke or charcoal. This barrow is expressly designed for carrying coke, charcoal, or other equally light material, and is not intended for use as a coal barrow. Weight of barrow, 126 lbs.  
Telegraph, Clay. Price, \$28 00

### COAL BARROWS.

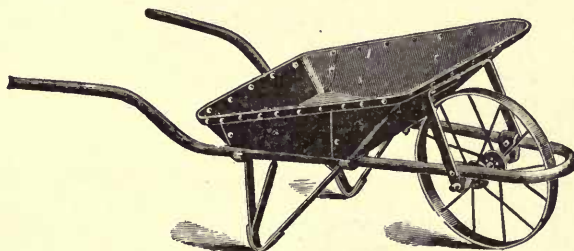


Fig. 1003.

- No. 46. Capacity, 300 lbs. coal, 32 in. wide, 18 in. wheel, tray of No. 16 steel; weight, 90 lbs.  
Telegraph, Clinton. Price, \$18 00
- No. 47. Capacity, 350 lbs. coal, 34 in. wide, 18 in. wheel, tray of No. 16 steel; weight, 100 lbs.  
Telegraph, Cook. Price, \$20 00
- No. 48. Capacity, 400 lbs. coal, 36 in. wide, 18 in. wheel, tray of No. 14 steel; weight, 120 lbs.  
Telegraph, Crawford. Price, \$24 00
- No. 56. Capacity, 300 lbs. coal, 32 in. wide, 18 in. wheel, tray of No. 14 steel; weight, 100 lbs.  
Telegraph, Casimir. Price, \$22 00
- No. 56 A. Same as No. 56, tray of No. 12 steel.  
Telegraph, De Kalb. Price, \$24 00
- No. 57. Capacity, 350 lbs. coal, 34 in. wide, 18 in. wheel, tray of No. 14 steel; weight, 112 lbs.  
Telegraph, De Witt. Price, \$24 00
- No. 57 A. Same as No. 57, tray of No. 12 steel.  
Telegraph, Douglas. Price, \$26 00
- No. 58. Capacity, 400 lbs. coal, 36 in. wide, 18 in. wheel, tray of No. 12 steel; weight, 145 lbs.  
Telegraph, Du Page. Price, \$28 00
- No. 58 A. Same as No. 58, tray of No. 10 steel.  
Telegraph, Edgar. Price, \$30 00



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## SUPPLY DEPARTMENT—Continued.

### ROLLING MILL BARROWS.

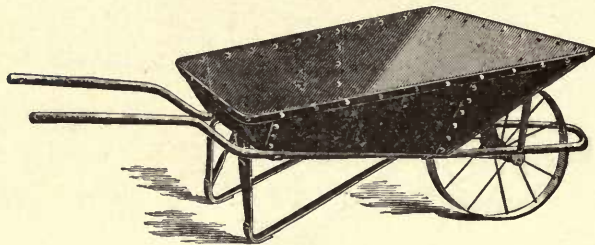


Fig. 1004.

Nos. 63 and 63 A are made like above cut, but if desired, will be made with short nose like Fig. 1010. Other sizes of mill barrows have trays same as Fig. 1010.

- |           |                                                                                          |                |
|-----------|------------------------------------------------------------------------------------------|----------------|
| No. 63.   | Capacity, 3 cubic ft., 27 in. wide, 18 in. wheel, tray of No. 10 steel; weight, 120 lbs. | Price, \$22 00 |
|           | Telegraph, Edwards.                                                                      |                |
| No. 63 A. | Same as No. 63, tray of No. 7 steel.                                                     | Price, \$26 00 |
|           | Telegraph, Effingham.                                                                    |                |
| No. 64.   | Capacity, 4 cubic ft., 28 in. wide, 18 in. wheel, tray of No. 10 steel; weight, 130 lbs. | Price, \$24 00 |
|           | Telegraph, Fayette.                                                                      |                |
| No. 64 A. | Same as No. 64, tray of No. 7 steel.                                                     | Price, \$28 00 |
|           | Telegraph, Ford.                                                                         |                |
| No. 65.   | Capacity, 5 cubic ft., 30 in. wide, 18 in. wheel, tray of No. 10 steel; weight, 140 lbs. | Price, \$26 00 |
|           | Telegraph, Ferdinand.                                                                    |                |

For heavy work these barrows have no equal. The tray is made of  $\frac{1}{4}$  in. steel plate, and all other parts, legs, braces and wheel, are built proportionately heavy, the handles being made of "extra strong" pipe. Considering their weight they are very light-running and easily handled, and for durability they cannot be excelled.

### PIG-METAL BARROWS.

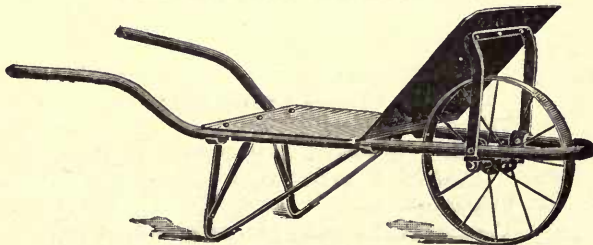


Fig. 1005.

- |         |                                                                                           |                |
|---------|-------------------------------------------------------------------------------------------|----------------|
| No. 51. | 18 in. wheel, tray $\frac{1}{4}$ in. steel, handles "extra strong" pipe; weight, 120 lbs. | Price, \$20 00 |
|         | Telegraph, Fulton.                                                                        |                |
| No. 52. | Two-wheel barrow, handles "extra strong" pipe; weight, 200 lbs.                           | Price, \$27 00 |
|         | Telegraph, Gallatin.                                                                      |                |

### PIG-METAL BARROWS.

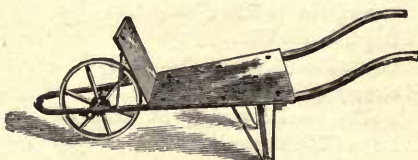


Fig. 1006.

- |         |                 |                   |                |
|---------|-----------------|-------------------|----------------|
| Size H. | Weight, 78 lbs. | Telegraph, Green. | Price, \$16 00 |
|---------|-----------------|-------------------|----------------|

### FOUNDRY BARROWS.

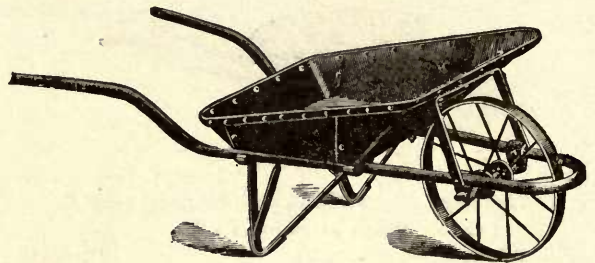


Fig. 1007.

- |         |                                                                                          |                |
|---------|------------------------------------------------------------------------------------------|----------------|
| No. 33. | Capacity, 3 cubic ft., 27 in. wide, 16 in. wheel, tray of No. 12 steel; weight, 95 lbs.  | Price, \$14 00 |
|         | Telegraph, Javiess.                                                                      |                |
| No. 34. | Capacity, 4 cubic ft., 28 in. wide, 16 in. wheel, tray of No. 12 steel; weight, 105 lbs. | Price, \$15 00 |
|         | Telegraph, Johnson.                                                                      |                |
| No. 35. | Capacity, 5 cubic ft., 30 in. wide, 16 in. wheel, tray of No. 12 steel; weight, 115 lbs. | Price, \$16 50 |
|         | Telegraph, Kane.                                                                         |                |

### FOUNDRY BARROWS.

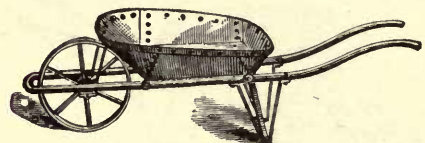


Fig. 1008.

- |           |                      |                |
|-----------|----------------------|----------------|
| Size 4 A. | Telegraph, Kankakee. | Price, \$14 00 |
| Size 5 A. | " Kendall.           | " \$15 00      |
| Size 6 A. | " Knox.              | " \$16 50      |

These barrows are made with trays of No. 12 steel, heavy legs and wheels, and especially adapted for wheeling castings, hot cinders, and general foundry and furnace use. The capacity of trays same as Nos. 4, 5, and 6, Fig. 1000.

### MINING BARROWS.

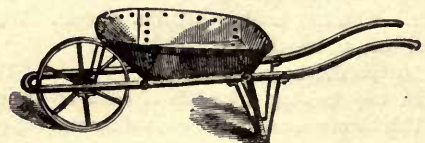


Fig. 1009.

- |                       |                     |                |
|-----------------------|---------------------|----------------|
| No. 4.                | Telegraph, Jackson. | Price, \$11 50 |
| No. 4 $\frac{1}{2}$ . | " Jasper.           | " \$12 25      |
| No. 5.                | " Jefferson.        | " \$14 25      |
| No. 6.                | " Jersey.           | " \$15 75      |



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## MINING BARROWS.

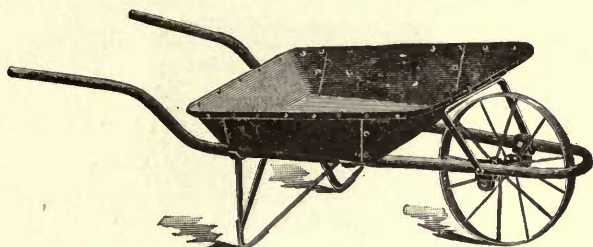


Fig. 1010.

- No. 23. Capacity, 3 cubic ft., 27 in. wide, 16 in. wheel, tray of No. 14 steel; weight, 80 lbs.  
Telegraph, Henderson. Price, \$12 25
- No. 24. Capacity, 4 cubic ft., 28 in. wide, 16 in. wheel, tray of No. 14 steel; weight, 85 lbs.  
Telegraph, Henry. Price, \$14 25
- No. 25. Capacity, 5 cubic ft., 30 in. wide, 16 in. wheel, tray of No. 14 steel; weight, 93 lbs.  
Telegraph, Iroquois. Price, \$15 75

## TWO-WHEEL BARROWS.

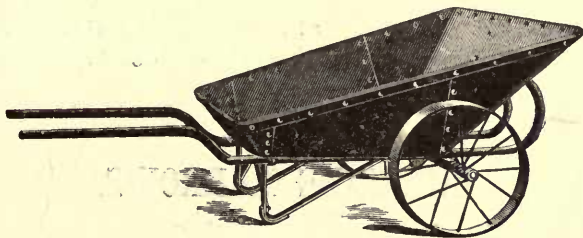


Fig. 1011.

- No. 78. Capacity, 400 lbs. coal, 36 in. wide, 16 in. wheels, tray of No. 12 steel; weight, 175 lbs.  
Telegraph, Grundy. Price, \$36 00
- No. 80. Capacity, 500 lbs. coal, 41 in. wide, 18 in. wheels, tray of No. 10 steel; weight, 230 lbs.  
Telegraph, Hamilton. Price, \$40 00
- No. 83. Capacity, 666 lbs. coal, 42 in. wide, 18 in. wheels, tray of No. 10 steel; weight, 230 lbs.  
Telegraph, Hancock. Price, \$48 00

## TWO-WHEEL BARROWS.

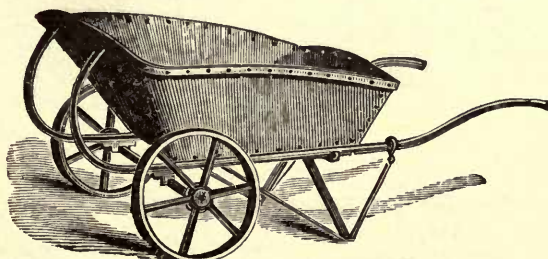


Fig. 1012.

Holding 500 lbs. Telegraph, Hardin.

Price, \$38 00

## COAL BARROWS.

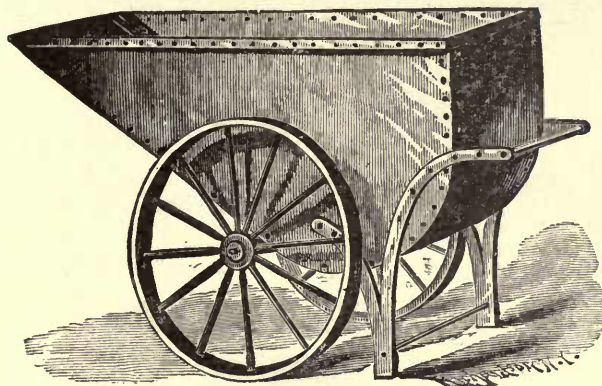


Fig. 1013.

- |                          |                  |                |
|--------------------------|------------------|----------------|
| Capacity, 400 lbs. coal. | Telegraph, Lake. | Price, \$65 00 |
| Capacity, 500 "          | " Lasalle.       | " \$70 00      |
| Capacity, 1000 "         | " Lawrence.      | " \$90 00      |
| Capacity, 1500 "         | " Lee.           | " \$112 50     |

Estimates furnished for special sizes on application.

## COKE BARROWS.

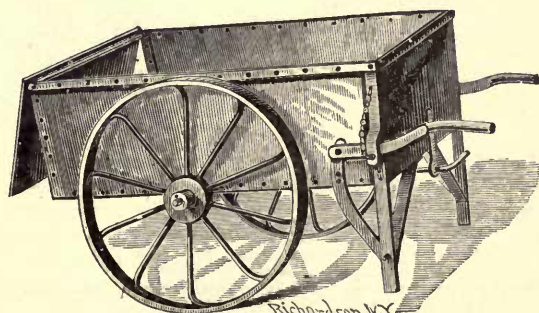


Fig. 1014.

- |                                                       |                    |                |
|-------------------------------------------------------|--------------------|----------------|
| Box of car, 4 ft. long, 2 ft. deep, 2 ft. 8 in. wide. | Telegraph, Peoria. | Price, \$65 00 |
| Box of car, 5 ft. long, 2 ft. deep, 3 ft. wide.       | Telegraph, Perry.  | Price, \$72 00 |
| Box of car, 6 ft. long, 2 ft. deep, 3 ft. wide.       | Telegraph, Piatt.  | Price, \$80 00 |
| Special sizes made when desired.                      |                    |                |



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## CHARGING CARS

(FOR GAS OR BOILER HOUSES.)

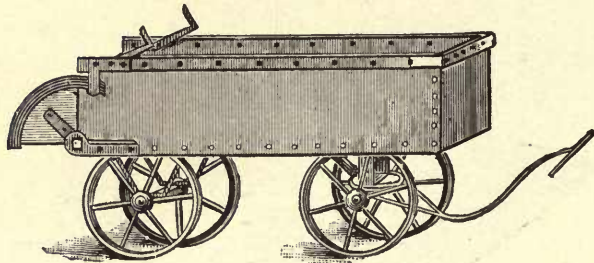


Fig. 1015.

Car holding 500 lbs. coal.	Telegraph, Monroe.	Price, \$50 00
Car " 700 "	" Montgomery.	" \$60 00
Car " 1000 "	" Morgan.	" \$75 00
Car " 1500 "	" Moultrie.	" \$90 00
Car " 2240 "	" Ogle.	" \$110 00

## CHARGING BARROWS.

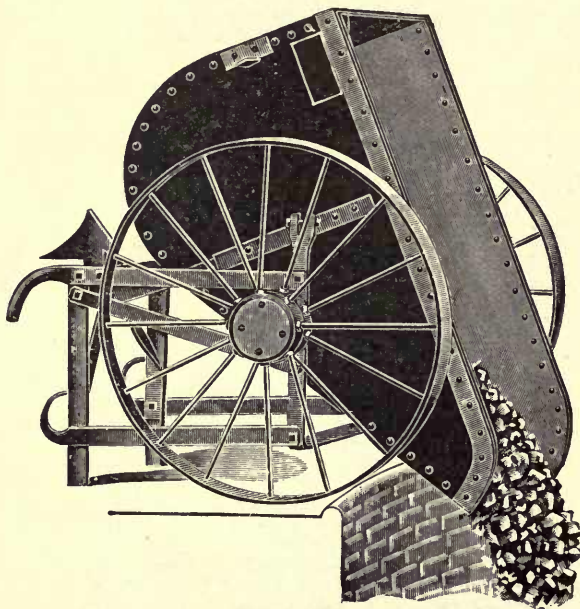


Fig. 1016.

In ordering always give exact height and width of hopper rim (check block or dumping block) over which barrow must dump.

Number.	Capacity.			Weight of Barrow.	Extreme Outside Dimensions in Inches.		Dimensions of Box in Inches.			Telegraph.	Price, Each.
	Cubic Feet.	Heaped Bushels.	Cubic Inches.		Length.	Breadth.	Length.	Depth.	Breadth.		
1	8	5½	13800	460	51	35	46	24	19	Livingston	\$100 00
2	10	7	17300	500	56	36	49	26	20	Norman	105 00
3	12	8	20700	525	56	40	49	26	24	McDonough	110 00
4	14	10	24200	600	58	40	53	28	24	McHenry	115 00
5	16	12½	31300	600	64	40	61	32	24	McLean	120 00
6	18	14	37500	660	72	40	69	35	24	Macon	125 00
7	20	16	41300	700	74	40	71	37	24	Macoupin	130 00
8	22	17½	45000	800	74	43	72	38	27	Madison	135 00
9	24	18	48500	830	78	46	76	40	30	Marion	140 00
10	26	20	52000	850	84	47	84	44	31	Mastiff	150 00

WEIGHTS OF SUBSTANCES:	Coke, . . .	cubic ft.,	28 lbs.	bushel, 40 lbs.	Wheels all 42 in. diameter.
	Iron Ore, . .	"	150 "	"	
	Stone, . . .	"	80 "	"	
	Coal, Soft, . .	"	50 "	"	
	Coal, Hard, . .	"	57 "	"	
	Charcoal, . .	"	20 "	"	30 "

## SIDE DUMPING CARS.

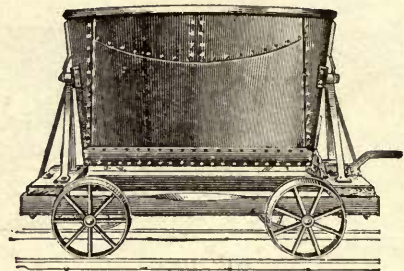


Fig. 1017.

Capacity.	Height car from track.	Height car when dumping.	Width on top.	Length over all.	Diameter wheels.	Gauge of Track unless otherwise ordered.	Distance wheels apart from centre to centre.	Telegraph.	Price, each.
1 ton	62 in.	72 in.	60 in.	90 in.	18 in.	30 in.	52 in.	Massac	\$150 00
1½ "	63 "	83 "	60 "	91 "	18 "	30 "	52 "	Menard	175 00
2 "	68 "	93 "	80 "	112 "	23 "	36 "	52 "	Mercer	225 00

This style car, which dumps its load on either side of track, we make three sizes of, but if necessary, others can be made to order. These cars we make very strong in all their parts, thus admitting of their being handled roughly without danger of breaking or getting out of order.

## CHARGING BARROWS.

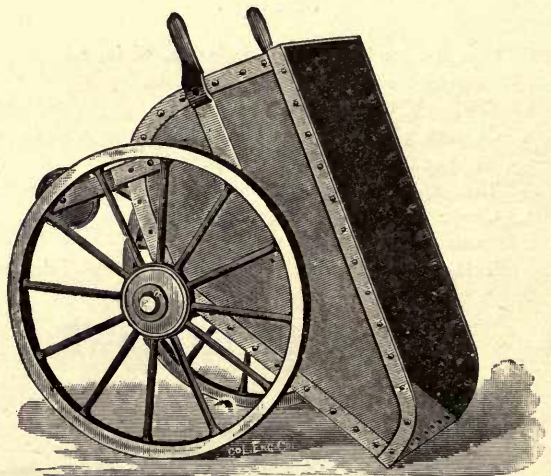


Fig. 1018.

Capacity, 10 cubic ft., or 1,500 lbs. iron ore or 500 lbs. coal.

Weight, 630 lbs.

Telegraph, Minerva.

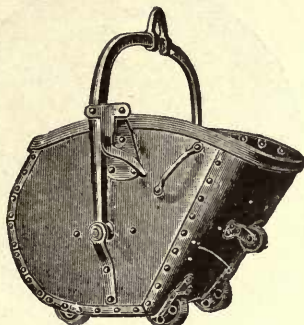
Price, \$

These barrows are made in all sizes and capacities. Prices upon application.



SUPPLY DEPARTMENT—Continued.

HORSE-POWER COALING TUBS.



SIDE CATCH.



BACK LEVER CATCH.

Fig. 1019.

Size No. Tub.	Capacity Tub.	Weight Tub.	Height from bottom to top of bail.	Width over all.	Size Wheels.	Telegraph.	Price.
1	1/8 of a ton	155 lbs.	35 in.	28 in.	4 x 2 in.	Pike	\$30 00
2	1/6 "	170 "	36 "	30 "	4 x 2 "	Pope	32 50
3	1/5 "	195 "	38 "	32 "	4 x 2 "	Pulaski	35 00
4	1/4 "	230 "	43 "	35 "	4 x 2 "	Putnam	40 00

STEAM-POWER COALING TUBS.

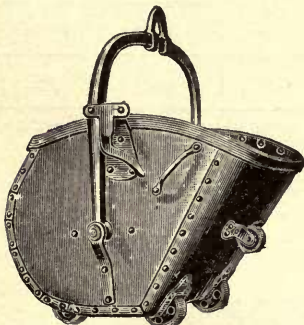


Fig. 1020.

Size No. Tub.	Capacity Tub.	Weight Tub.	Height from bottom to top of bail.	Width over all.	Size Wheels.	Telegraph.	Price.
5	1/4 heavy	270 lbs.	43 in.	35 in.	5 x 3 in.	Randolph	\$45 00
6	600 lbs. coal	280 "	44 "	38 "	5 x 3 "	Richland	65 00
7	700 "	370 "	46 "	42 "	6 1/2 x 3 "	Rock Island	75 00
8	1120 "	480 "	53 "	45 "	6 1/2 x 3 "	Clair	90 00
8 1/2	1500 "	550 "	56 "	51 "	6 1/2 x 3 "	Saline	110 00
9	2240 "	600 "	58 "	55 "	6 1/2 x 3 "	Sangamon	150 00

HOISTING TUBS.

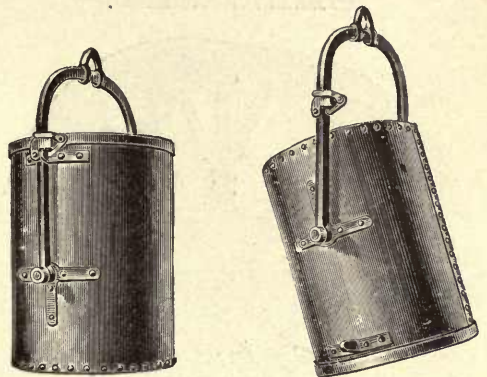


Fig. 1021.

24 in. in diameter, 36 in. deep. Telegraph, Schuyler. Price, \$55 00  
30 " " 42 " " Sylvia. " \$75 00

The above engraving represents our ore tub, which is generally adapted for mines. They are made in the best possible manner of 3-16 inch steel, are well riveted, have strong bands around the top, and are reliable and substantial. The bail and catch on these tubs are strong and simple.

THE CHAMPION FLOUR SCOOP.

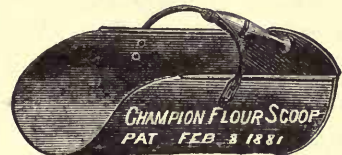


Fig. 1022.

Is made of SHEET STEEL or XXXX tin plate, with handle of wrought iron. The handle being placed in the centre instead of at the end, as in the old style scoop, distributes the weight evenly, thus making the handling of material easier and quicker. This style of scoop, made as above, will outlast several of the old patterns.

10 in., steel.	Telegraph, Jennings.	STEEL.	Net price, \$0 85
12 " " "	Kosciusko.	"	\$1 00
14 " " "	La Grange.	"	\$1 25

HERCULES STEEL SCOOP.



Fig. 1023.

This is named the Hercules because it is the strongest scoop in the market. It is made of *fine planished sheet steel*, well put together, and will outwear several of the ordinary iron scoops. At the same time it is much lighter in weight. One man can do double the work with this that can be done with the common long-handled scoop. He can get right down to his work and take up twice the amount, with 2 large saving of labor, because he has the scoop close to him instead of at arm's length, and the front handle over the load.

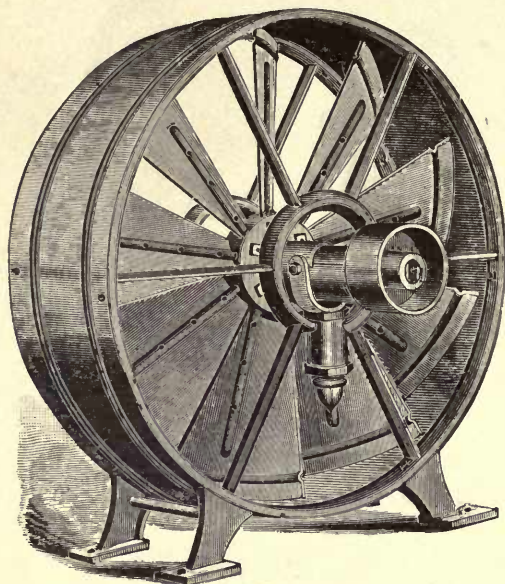
Bushel scoop.	Telegraph, John.	Net price, \$3 00
Half-bushel scoop.	Jay.	" \$2 50



SUPPLY DEPARTMENT—Continued.

PATENT ADJUSTABLE HUB VENTILATING FANS.

Drying, Ventilating and Exhaust Fans.  
Style No. 5.



Style A A—Fig. 1024.

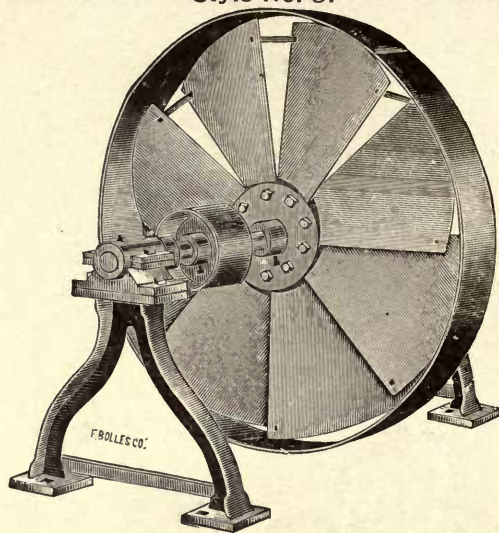


Fig. 1026.

Style.	Diam.	Revolutions.	Capacity.	Pulleys.	Horse-Power.	Telegraph.	Price.
A A	12 in.	800 to 1,600	1,200 to 2,600	2 x 2	1-10 to 1/4	Woodford	\$20 00
"	18 "	600 to 1,400	1,500 to 4,300	3 x 2 1/2	1-10 to 5/8	Allen	35 00
"	24 "	500 to 1,200	2,800 to 9,000	4 x 2 1/2	1 1/2 to 5/8	Bartholomew	45 00
"	30 "	400 to 1,100	4,000 to 15,000	5 x 3	1 1/2 to 7/8	Benton	60 00
"	36 "	400 to 1,000	8,800 to 20,000	6 x 3	1 1/2 to 1 1/4	Blackford	80 00
"	42 "	300 to 850	9,000 to 28,000	7 x 4	3/8 to 2	Davies	100 00
"	48 "	300 to 800	15,000 to 42,000	8 x 4	3/4 to 3 1/4	Dearborn	120 00
"	54 "	250 to 700	16,000 to 48,000	8 x 4	3/4 to 3 1/2	Decatur	150 00
"	60 "	250 to 600	25,000 to 62,000	9 x 5	7/8 to 4 1/2	Delaware	190 00

Style.	Diameter of Wheel. Inches.	Diameter of Pulley. Inches.	Face of Pulley. Inches.	Telegraph.	Price.
No. 1	24	6	3	Shelby	\$49 50
No. 2	24	6	3	Stark	52 00
No. 3	24	6	3	Stephenson	47 00
No. 4	24	6	3	Tazewell	43 00
No. 1	36	7	4	Union	59 50
No. 2	36	7	4	Vermillion	62 00
No. 3	36	7	4	Wabash	57 00
No. 5	36	7	4	Wallace	52 00
No. 1	48	8	5	Warnock	68 50
No. 2	48	8	5	Wharf	70 00
No. 3	48	8	5	White	67 00
No. 5	48	8	5	Whiteside	60 00
No. 1	60	10	6	Will	100 00
No. 3	60	10	6	Williamson	95 00
No. 5	60	10	6	Winnebago	90 00

In ordering, do not fail to inform us the kind and amount of work they are to do; also, please state whether pulley is wanted on the right or left hand side (in other words, on the side where the air is going in or out). Also, state if fan is to be run horizontally or perpendicularly in roof, ceiling, or cupalo, in connection with perpendicular pipe, and if pulley is desired above or below the fan.

DRYING AND EXHAUST FANS.

Style No. 1.

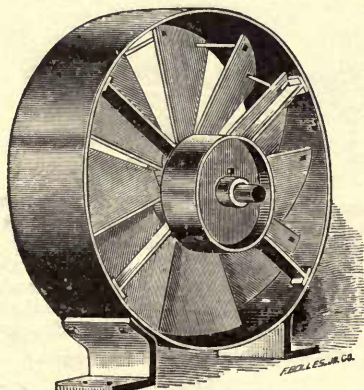


Fig. 1025.

DRYING AND EXHAUST FANS.

Style No. 3.

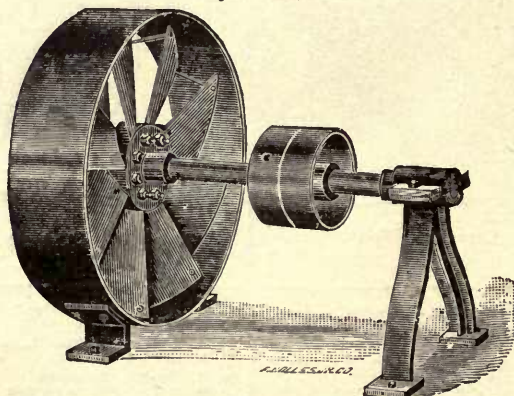


Fig. 1027.



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## SUPPLY DEPARTMENT—Continued.

### ASH CANS.

GALVANIZED.

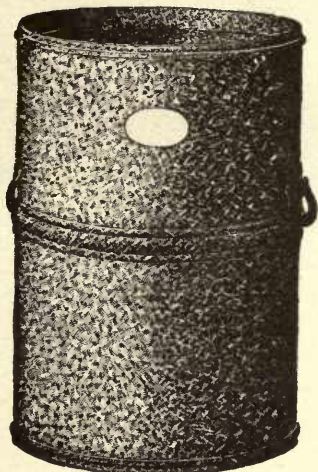


Fig. 1028.

Size.	Dimensions, Inches.	Telegraph.	Price.
No. 2½.	14 x 19	Philamon	\$4 00
" 3.	15 x 26	Ripley	4 50
" 4.	17 x 26	Rush	5 25
" 5.	18 x 26	Saint	5 50
" 6.	20 x 26	Spencer	6 50

### ASH CANS.

GALVANIZED. WITH EIGHT WOOD STRAPS.

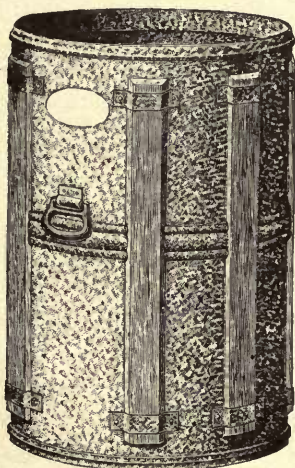


Fig. 1029.

Size.	Dimensions, Inches.	Telegraph.	Price.
No. 7.	15 x 26	Steuben	\$5 25
" 8.	17 x 26	Sullivan	6 00
" 9.	18 x 26	Switzerland	6 25
" 10.	20 x 26	Tippecanoe	7 25

### OIL WASTE CANS.

SELF-CLOSING COVER.

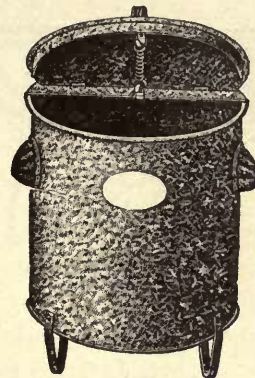


Fig. 1030.

Diameter, 11¼ in.; height, 15 in.  
Telegraph, Tipton.

Price, \$1 50

### PORTABLE HOISTS.

(TEALS'.)

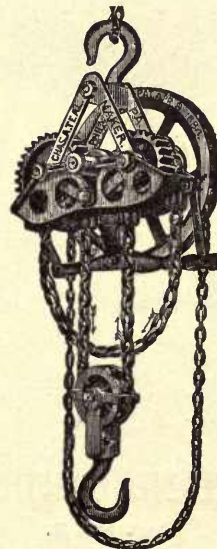


Fig. 1031.

Capa- city.	Lift.	Weight, Complete.	Shortest Distance from Hook to Hook.	Hand Chain Overhauled to 1 Ft. Lift of Load.	Telegraph.	Price.	Extra Lift per Foot.
¼ ton	8 ft.	27 lbs.	18 in.	28 ft.	Dubois	\$22 50	\$0 80
½ " "	8 " "	47 " "	19 " "	38½ " "	Elkhart	25 00	0 90
1 " "	8 " "	73 " "	20 " "	50 " "	Florence	30 00	1 00
2 " "	9 " "	147 " "	27 " "	99 " "	Fountain	50 00	1 40
3 " "	10 " "	193 " "	28 " "	120 " "	Gibson	70 00	1 70
4 " "	10 " "	236 " "	36 " "	134 " "	Grant	95 00	2 10
5 " "	12 " "	308 " "	38 " "	158 " "	Harrison	125 00	2 60
6 " "	12 " "	350 " "	42 " "	210 " "	Hendricks	160 00	3 20
8 " "	12 " "	475 " "	45 " "	260 " "	Howard	225 00	3 90
10 " "	12 " "	625 " "	51 " "	330 " "	Huntington	300 00	4 75

For extra lift per foot, prefix R to the telegraph word, viz.:  
Rdubois.



SUPPLY DEPARTMENT—Continued.

HAND CARTS.

Cart No. 2.

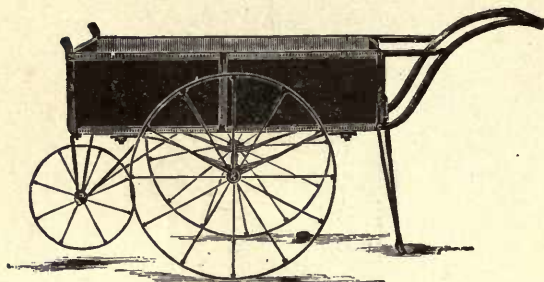


Fig. 1032.

Size, inside of body, 39 x 20½ in.; height, 10 in.

With three wheels; wheels, 26 in.; will carry 300 lbs.

Telegraph, Wesley.

Price, \$15 00

With two wheels; wheels, 26 in.; will carry 300 lbs.

Telegraph, Wells.

Price, \$13 00

HAND CARTS.

Cart No. 4.

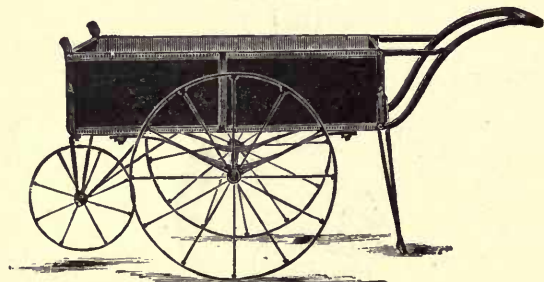


Fig. 1033.

Size, inside of body, 40 x 26 in.; height, 10 in.

With three wheels; wheels, 26 in. Will carry 300 lbs.

Telegraph, Whitley.

Price, \$16 00

With two wheels; wheels, 26 in. Will carry 300 lbs.

Telegraph, Adair.

Price, \$14 00

HAND CARTS.

Cart No. 3.

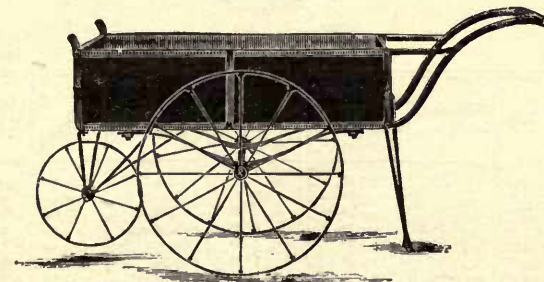


Fig. 1034.

Size, inside of body, 39 x 24 in.; height, 10 in.

With three wheels. Telegraph, Allamakee.

Price, \$15 50

With two " " Appanoose.

" \$13 50

HAND CARTS.

DROP END-BOARD.

Cart No. 5.

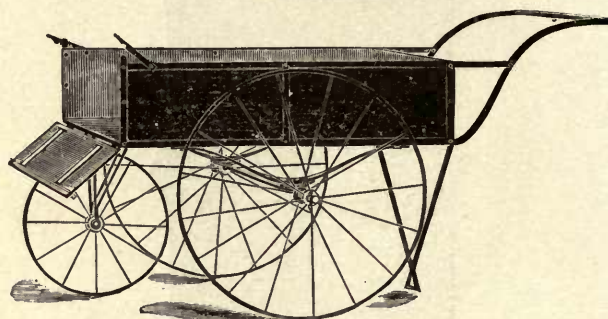


Fig. 1035.

Drop End-Board. Size, inside of body, 40 x 26 in.; height, 10 in.

With three wheels; wheels, 30 in.; will carry 400 lbs.

Telegraph, Audubon.

Price, \$17 00

OIL TANKS.

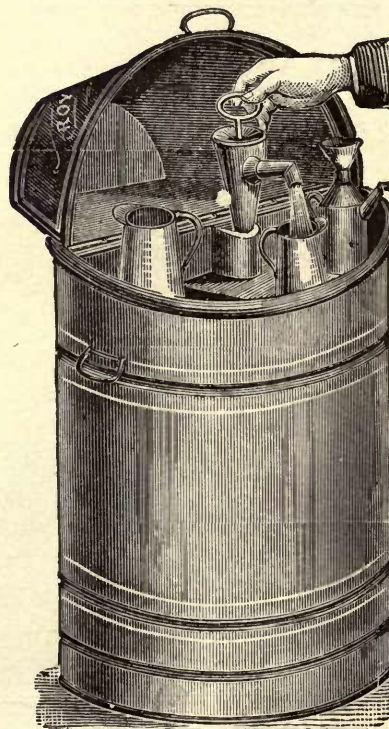


Fig. 1036.

Capacity, 60 gallons. Telegraph, Vanderburg.

Price, \$14 00

Capacity, 100 " " Vigo.

" \$22 00



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## SEPARATING MACHINE.

WOODRUFF'S PATENT.

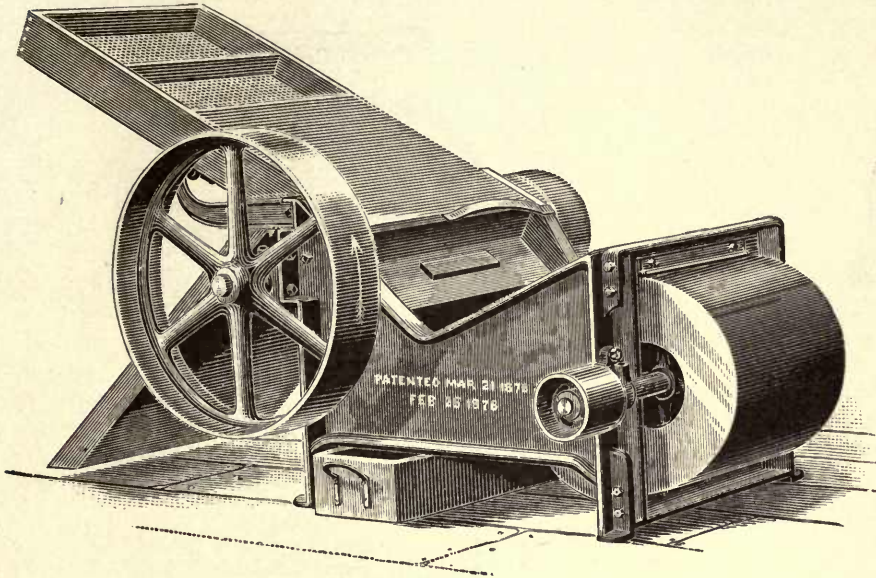


Fig. 1037.

- No. 1. Intended for foundries melting less than 10 tons daily.  
Telephone, Louisa. Price, \$160 00
- No. 2. Intended for foundries melting 10 to 20 tons daily.  
Telephone, Lucas. Price, \$200 00
- No. 3. Intended for foundries melting over 20 tons daily.  
Telephone, Lyon. Price, \$240 00

## No. 1 POWER MILL.

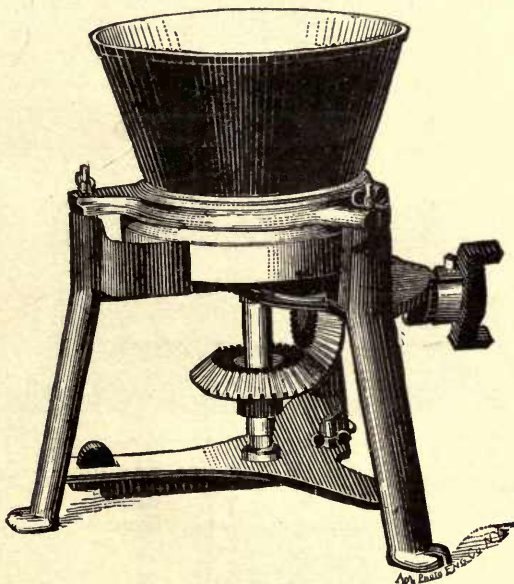


Fig. 1038.

Is 12 in. in diameter, with hopper 8½ in. deep, which holds 3 gallons. Same hanger and pulley used as with No. 0. Prices quoted upon application.

Pulleys should make 100 revolutions per minute. Weight, 200 lbs.

Price of Mill. Telephone, Mahaska. Price, \$  
Price of Mill, with hanger and pulleys. " Mills. " \$

## No. 3 HAND MILL.



Fig. 1039.

Is 6 in. in diameter, with hopper 5 in. deep, which holds ½ gallon. Prices quoted upon application.

Telegraph, Mitchell. Price, \$

## No. 0 POWER MILL.

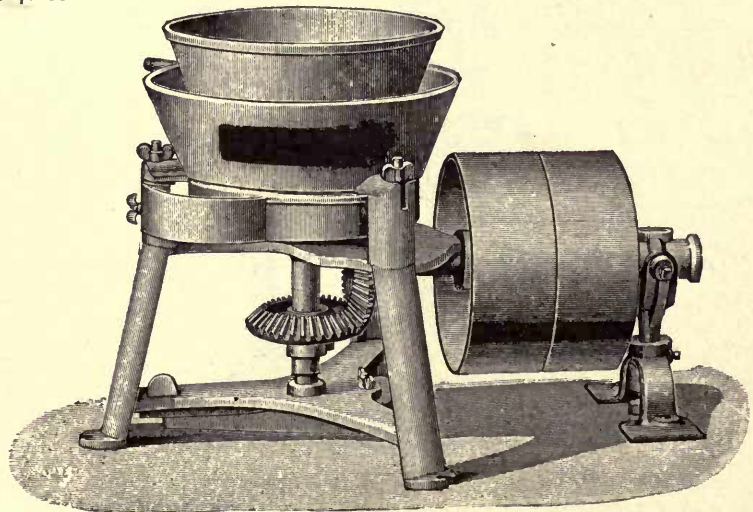


Fig. 1040.

Is 13 in. in diameter, with hopper 13 in. deep, which holds 9 gallons. Hanger is 16 in. long, with tight and loose pulleys, 5 x 12, which should make 125 revolutions per minute. Prices quoted upon application.

Price of Mill. Telephone, Monona. Price, \$  
Price of Mill, with hanger and pulleys. " Muscatine. " \$



SUPPLY DEPARTMENT—Continued.

WESTERN PATTERN COPYING PRESSES.

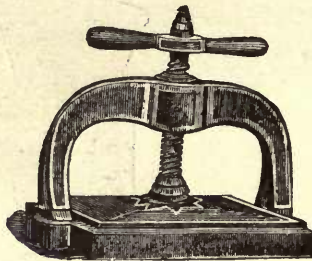


Fig. 1041.

NEATLY JAPANNED IN BLACK.  
With Bronze Stripe.

No. 1	receives a book, 9 x 11.	Telegraph, Baldwin.	Price, \$7 50
No. 2	" " 10 x 12.	" Black Hawk.	" \$8 00
No. 3	" " 10 x 15.	" Bremer.	" \$10 00

Fig. 1042.

FINISHED IN FANCY COLORS.  
Gold Stripe, Brass Cap.

No. 1	receives a book, 9 x 11.	Telegraph, Buchanan.	Price, \$9 25
No. 2	" " 10 x 12.	" Buena Vista.	" \$9 75
No. 3	" " 10 x 15.	" Butler.	" \$11 75

The above presses furnished with "ball" or "straight handles," same price.

PLAIN PATTERN COPYING PRESSES.

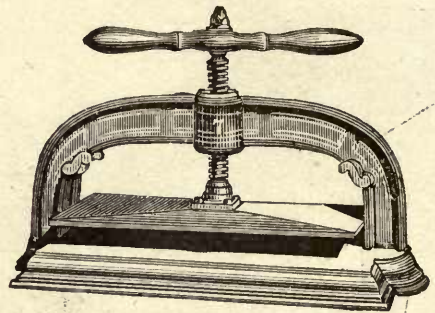


Fig. 1045.

JAPANNED IN BLACK, GILT STRIPING.

No. 3	receives a book, 9 x 12.	Telegraph, Davis.	Price, \$8 00
No. 4	" " 10 x 13.	" Darius.	" \$9 00
No. 5	" " 10 x 15.	" Derrick.	" \$11 00
No. 7	" " 10½ x 16.	" Duncan.	" \$12 00
No. 9	" " 12 x 18.	" Dickinson	" \$14 00

Fig. 1046.

EXTRA FINISH, IN FANCY COLORS.

No. 3	receives a book, 9 x 12.	Tel graph, Dubuque.	Price, \$9 75
No. 4	" " 10 x 13.	" Emmett.	" \$10 75
No. 5	" " 10 x 15.	" Floyd.	" \$12 75
No. 7	" " 10½ x 16.	" Fremont.	" \$14 50
No. 9	" " 12 x 18.	" Guthrie.	" \$17 00

The above presses furnished with "ball" or "straight handles," same price.

RAILROAD AND EXPRESS COPYING PRESSES.

SHORT ARCH.

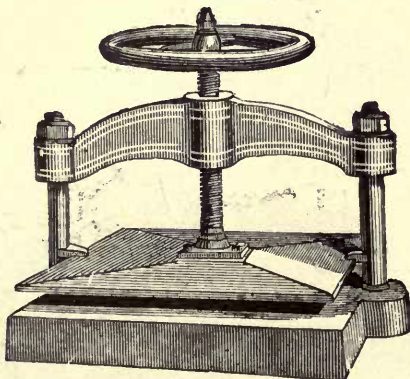


Fig. 1043.

JAPANNED BLACK, WITH GOLD STRIPING.

No. 1	receives a book, 14 x 18.	Telegraph, Cedar.	Price, \$20 00
No. 2	" " 16 x 20.	" Cerro Gordo.	" \$24 00
No. 3	" " 18 x 23.	" Cherokee.	" \$32 00

Fig. 1044.

EXTRA FINISH, IN FANCY COLORS.  
Polished Nickel-Plated Columns.

No. 1	receives a book, 14 x 18.	Telegraph, Chickasaw.	Price, \$24 00
No. 2	" " 16 x 20.	" Clayton.	" \$28 00
No. 3	" " 18 x 23.	" Dallas.	" \$36 00

The above presses furnished with "ball" or "straight handles," same price.

RAILROAD AND EXPRESS COPYING PRESSES.

LONG ARCH.

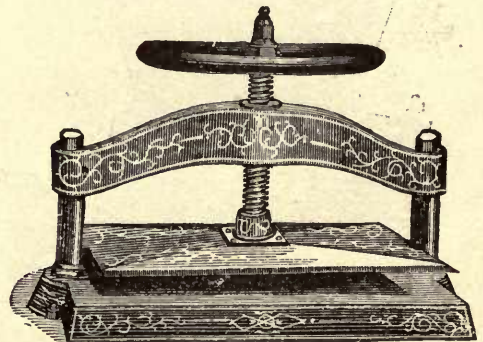


Fig. 1047.

No. K	receives a book, 15 x 20.	Telephone, Jones.	Price, \$29 00
No. F	" " 17 x 22.	" Haman.	" \$37 00
No. G	" " 20 x 27½.	" Humboldt.	" \$54 00
No. H	" " 22 x 24.	" Ida.	" \$52 00

Fig. 1048.

EXTRA FINISH, NICKEL-PLATED COLUMNS.

No. K	receives a book, 15 x 20.	Telephone, Iowa.	Price, \$32 00
No. F	" " 17 x 22.	" Keokuk.	" \$40 00
No. G	" " 20 x 27½.	" Kossuth.	" \$57 00
No. H	" " 22 x 24.	" Lynn.	" \$55 00

The above presses furnished with "ball" or "straight handles," same price.



SUPPLY DEPARTMENT—Continued.

BALING PRESSES.

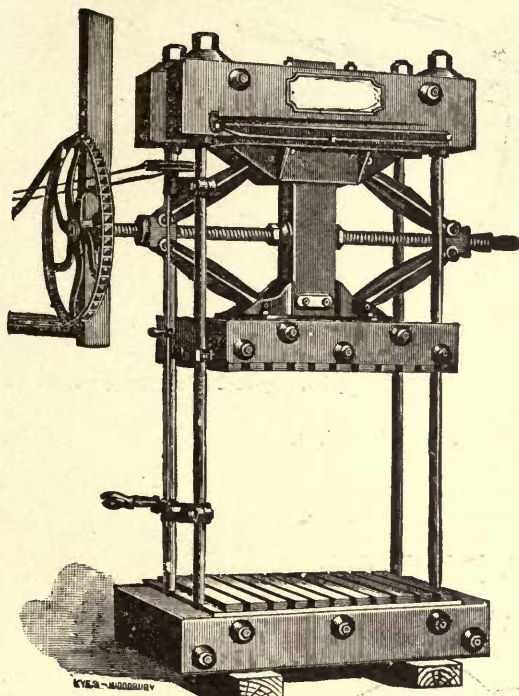


Fig. 1049.

The press is for baling cotton cloth, yarn, paper, etc. It is operated by an automatic attachment, and has the pressure indicator, showing the amount of pressure put upon the goods. For extra quick work we put a pulley on the screw instead of the chain wheel, and operate it with a belt. As the frame is of wood, we can vary the dimensions given to suit the work required. We can also give any amount of daylight, or movement of follower required. Owing to the varying needs of different goods, prices will be quoted on application.

TINCTURE PRESS.

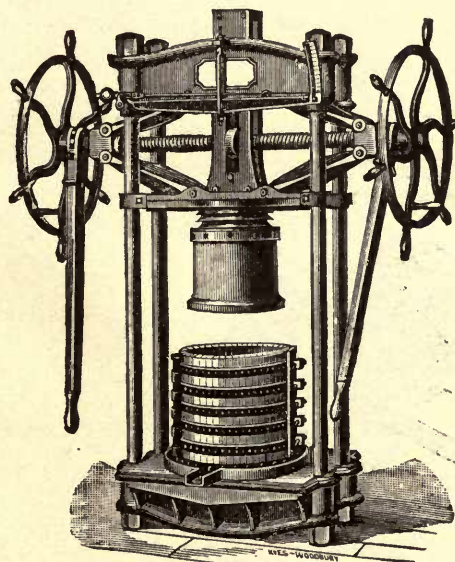


Fig. 1050.

This press is for the use of manufacturing chemists and druggists, in extracting the liquor from macerated roots and herbs. It is very heavy and powerful, the hoop being of wrought-iron staves and bands, and made very strong to withstand the immense pressure exerted. It is hinged to a rigid back, which is fastened to the base, allowing each side of the hoop to be opened and swung out to remove the pressed material. The plunger is attached to the platen by a large screw thread, allowing it to be run up or down to adjust the distance it enters the hoop. The indicator enables the operator to determine when the material is sufficiently pressed, and to avoid overstraining the press. It may be worked by hand or power, and the hoop will be made of a size suitable for the work desired. Prices according to size of hoop and nature of material to be pressed.

PATENT AUTOMATIC LOCK  
TACKLE BLOCKS.

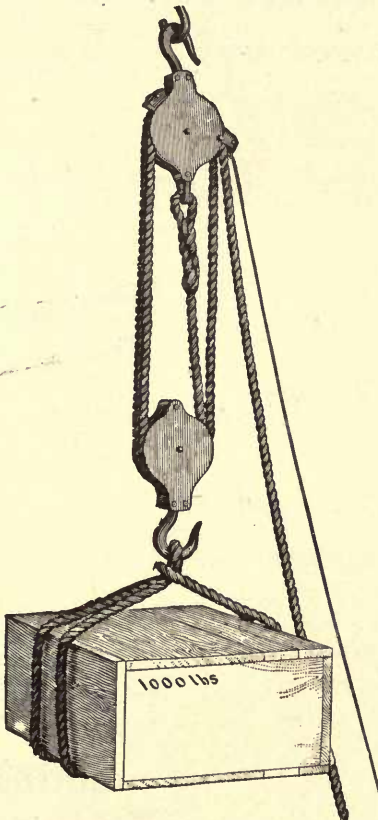


Fig. 1051.

No.	No. of Sheaves	Size Rope.	Lbs. one man can Hoist.	Lbs. Capacity.	Telegraph.	Price, with rope for 10 feet hoist	Without Rope.
9	2 and 1	$\frac{5}{8}$	350	1,000	La Porte	\$6 50	\$5 70
10	2 and 2	"	500	1,500	Martin	7 00	6 00
11	3 and 2	"	625	2,000	Miami	8 00	6 80
12	3 and 3	"	750	3,000	Michael	9 00	7 60
13	4 and 3	"	900	3,500	Marduke	10 00	8 35
9	2 and 1	$\frac{3}{4}$	350	1,250	Noble	7 80	6 50
10	2 and 2	"	500	1,800	Ohio	8 65	7 00
11	3 and 2	"	625	2,500	Orange	10 00	8 00
12	3 and 3	"	750	3,700	Owen	11 25	9 00
13	4 and 3	"	900	4,000	Parke	12 50	10 00

For tackle blocks without ropes prefix F to the telegraph word viz.: Fohio.



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## THE "COLUMBUS" STEEL TRAY WHEELBARROWS.

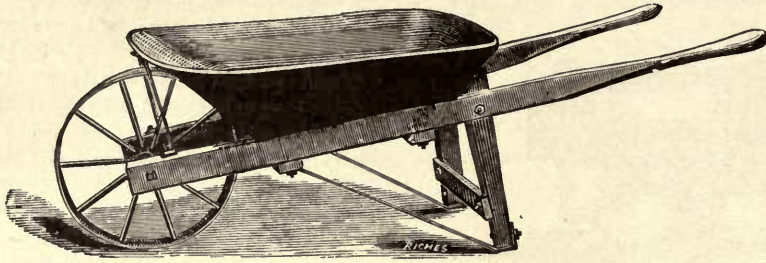


Fig. 1052.

No. 1. Greatest width of tray, 30 in., greatest length, 34 in., greatest depth,  $7\frac{1}{2}$  in., capacity, 3 cubic ft., wheel,  $16\frac{1}{2}$  in., tray of No. 15 steel; weight, 65 lbs.

Telegraph, Way.

Price, \$ 7 50

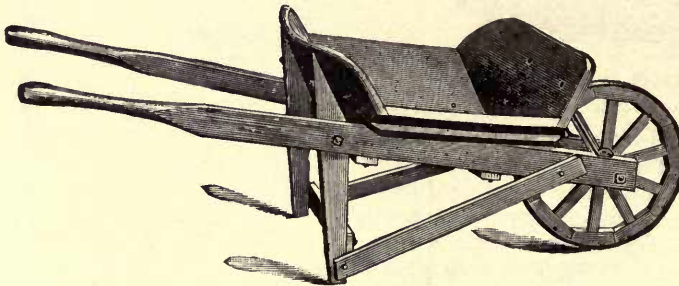
No. 2. Greatest width of tray,  $28\frac{1}{2}$  in., greatest length, 36 in., greatest depth, 9 in., capacity, 4 cubic ft., wheel,  $16\frac{1}{2}$  in., tray of No. 15 steel; weight, 72 lbs.

Telegraph, Walnut.

Price, \$ 9 00

## RAILROAD OR CANAL BARROW.

(WITH JACOBS' PATENT WOOD WHEEL.)



THE "BOSS."

Fig. 1053.

Tray bolted to legs and handles. Planed and well finished. Wheel painted.

Telegraph, Wake.

Price, per dozen, \$44 00

## RAILROAD OR CANAL BARROW.

(WITH JACOBS' PATENT STEEL SPOKE WHEEL.)



Fig. 1054.

Diameter of wheel, 16 in., wrought-iron tire,  $1\frac{1}{2}$  in. wide, steel spokes.

Telegraph, Wale.

Price, per dozen, \$45 00



# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## MORTAR OR ORE BARROW.

(WITH JACOBS' PATENT WHEEL.)

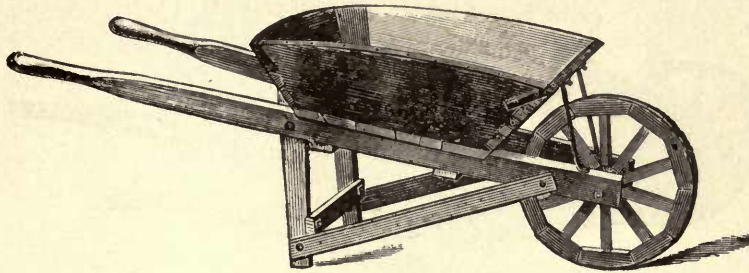


Fig. 1055.

Tray corner-locked and bolted to legs and handles. The barrow for miners and builders. Painted.

Tel., Walk.  
Tel., Wall.

Price, per dozen, with wood wheel, \$51 00  
" " " steel " 53 00

## WHARF OR OYSTER BARROW.

(WITH JACOBS' PATENT WHEEL.)

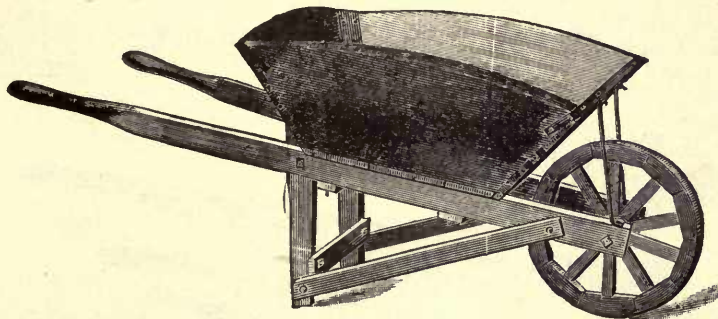


Fig. 1056.

All hard-wood, side and end-pieces of tray dovetailed together, iron-strapped, and firmly nailed. Thoroughly braced and bolted, tray iron-strapped on top.

Size of tray, 12 in. deep at handles and 16 in. at wheel, bottom, 17 in. wide by 18 in. long, top, 32 in. wide

by 33 in. long, wheel, 17 in. diameter; painted brown, wheel lead colored.

Tel., Wallop.  
Tel., Wallow.

Price, per dozen, with wood wheel, \$55 50  
" " " steel " 58 00

## WHARF OR OYSTER BARROW.

(EXTRA HEAVY.)

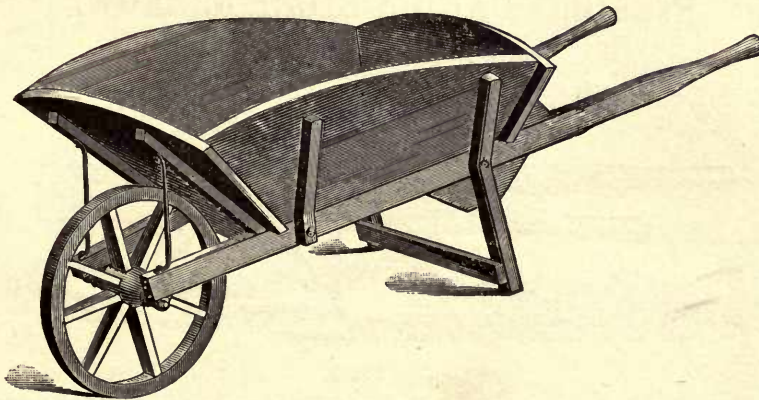


Fig. 1057.

Made of thoroughly seasoned oak. Will hold eight bushels.

Telegraph, Tamer.

Price, per dozen, with wood wheel, \$72 00

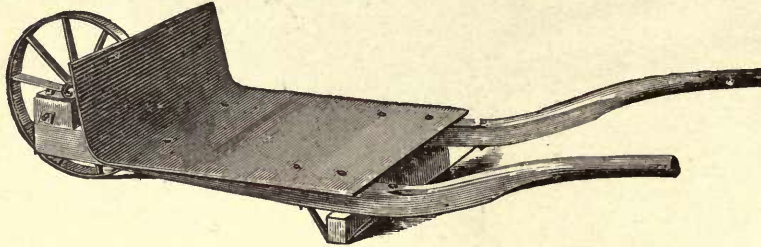


**RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.**

**SUPPLY DEPARTMENT—Continued.**

## **STEEL BOTTOM STONE BARROW.**

(WITH JACOBS' PATENT STEEL SPOKE WHEEL.)



**Fig. 1058.**

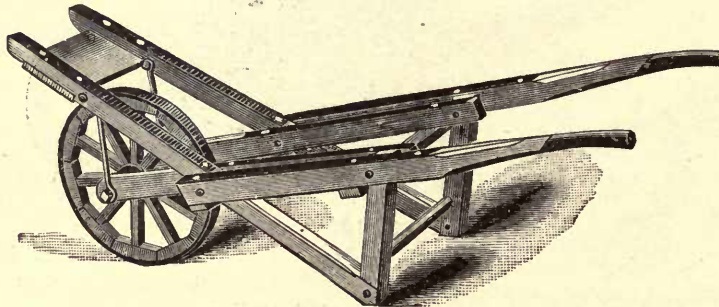
**THE STRONGEST AND BEST STONE BARROW MANUFACTURED.**

Telegraph, Wadsworth.

Price, per dozen, \$108 00

## **STAVE OR BARK BARROW.**

(WITH JACOBS' PATENT WHEEL.)



**Fig. 1059.**

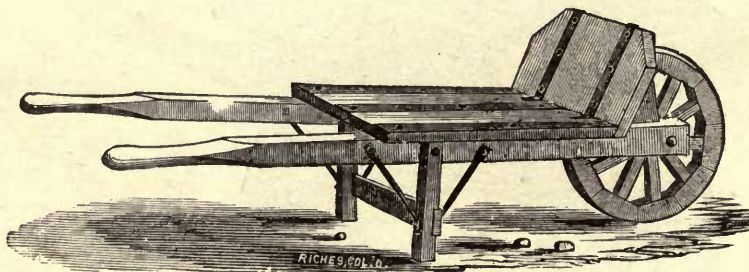
Well finished, painted, and varnished.

Telegraph, Wart.

Price, per dozen, \$90 00

## **STRAIGHT HANDLE STONE BARROW.**

(WITH JACOBS' PATENT WHEEL.)



**Fig. 1060.**

**FOR STONE OR PIG METAL. STRONG AND CHEAP. (PAINTED.)**

Telegraph, Warm.

Price, per dozen, \$63 00



RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

SUPPLY DEPARTMENT—Continued.

## TIGHT BOTTOM BRICK BARROW.

(WITH JACOBS' PATENT WHEEL.)

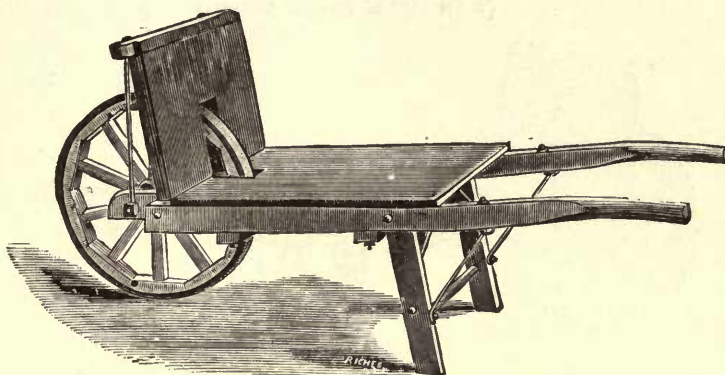


Fig. 1061.

Same as Fig. 1064, except having closed bottom. Diameter of wheel, 19 in., width of tire,  $1\frac{3}{4}$  in.  
Telegraph, Wait. Price, per dozen, \$80 50

## BENT HANDLE STONE BARROW.

(WITH JACOBS' PATENT WHEEL.)

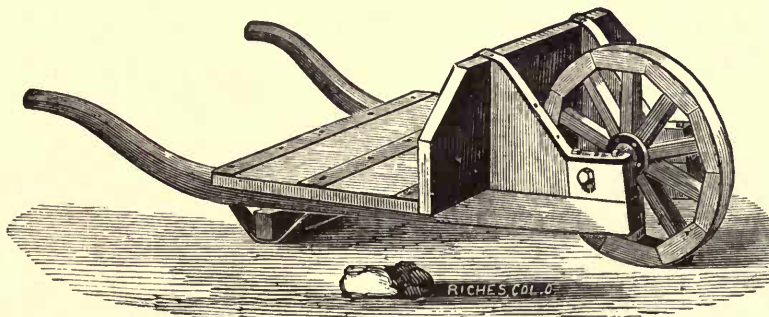


Fig. 1062.

Telegraph, Warp.

Price, per dozen, \$70 50

## RED OAK OR GOVERNMENT BARROW.

(WITH 18-INCH PATENT IRON HUB WHEEL.)

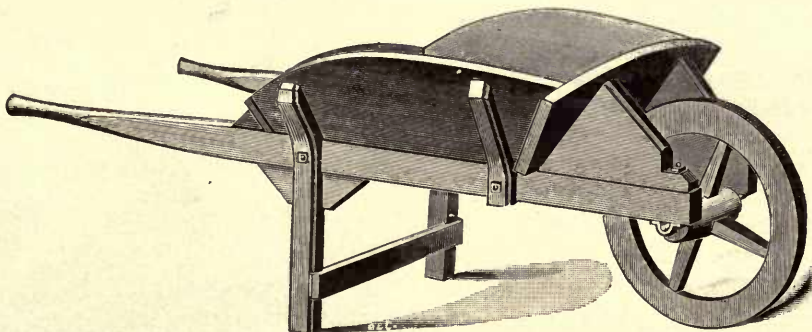


Fig. 1063.

Made of oak throughout and according to specifications furnished by the U. S. Quartermaster's Department.

Telegraph, Thompson.

Price, per dozen, \$52 00



## OPEN BOTTOM BRICK BARROW.

(WITH JACOBS' PATENT WHEEL.)

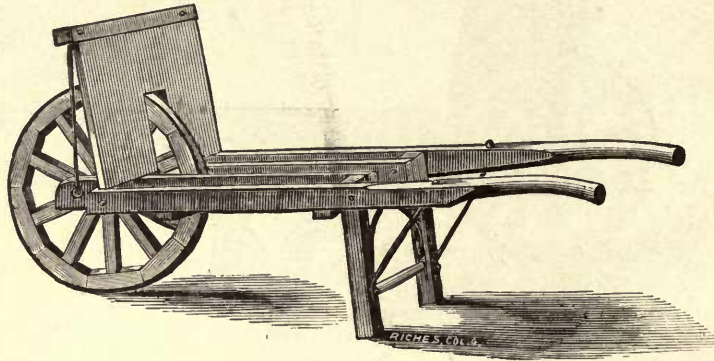


Fig. 1064.

This Barrow is designed for use in brick-yards, and especially for handling green brick. Folds for shipping. Diameter of wheel, 19 in., width of tire,  $1\frac{1}{4}$  in. Telegraph, Watch. Price, per dozen, \$78 00

## THE "COLUMBUS" SOLID STEEL SCRAPERS.

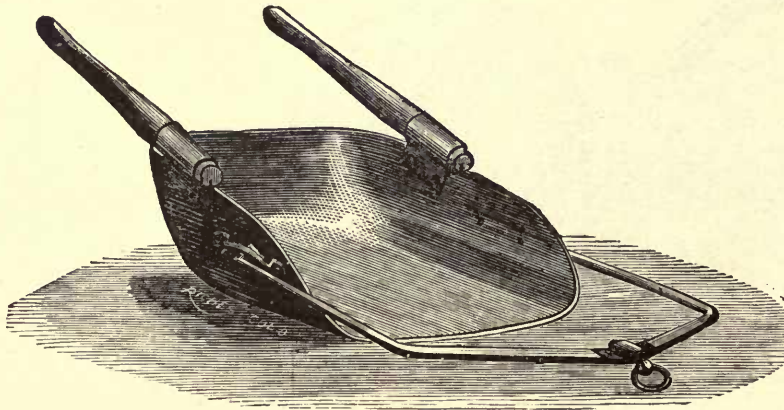


Fig. 1065.

- No. 1.—Carries 7 ft. of earth. Used for long haul, or down grade. Telegraph, Worker. Price, \$15 00
- No. 2.—Carries 5 ft. of earth. For all ordinary Grading, Farm, or Road work. Telegraph, Wooden. Price, 14 00
- No. 3.—Carries 3 ft. of earth. Intended for work on narrow ditch with one horse. Telegraph, Warrior. Price, 13 00

In ordering these Scrapers, give name "Columbus," to distinguish from other Scrapers made by us, also use telegraph name and figure.

The Bails are of steel, and of improved pattern, with strong and perfect working swivels.

We ship always *without runners*, unless otherwise directed.

Automatic End-Gate Attachment, extra.

Telegraph, Worn. Price, \$5 00

With Runners, extra. Telegraph, Worth. " 1 00

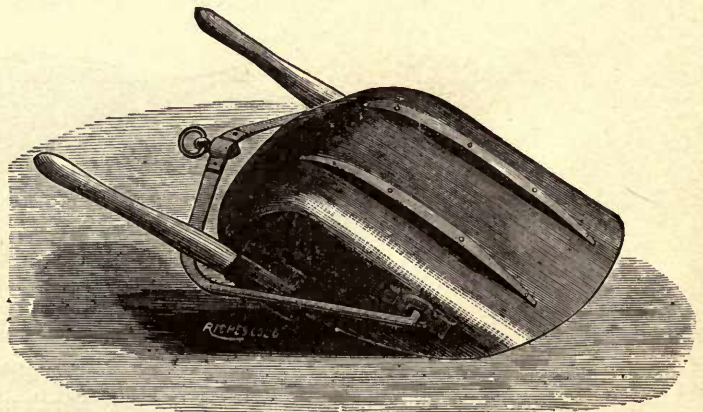


Fig. 1066.



SUPPLY DEPARTMENT—Continued.

# THE AUTOMATIC REVOLVING ROAD SCRAPER.

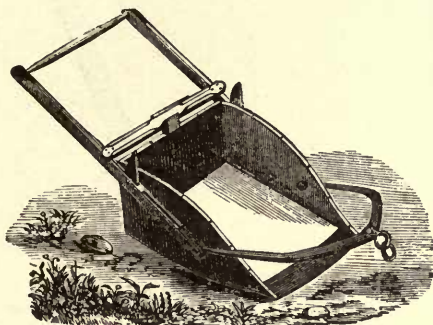


Fig. 1067.

30-inch wood bottom.	Price, \$18 00	Telegraph, West.
33 " "	" 19 00	" Wert.
36 " "	" 20 00	" Wet.

In ordering these Scrapers, give name "Revolving," to distinguish from the other Scrapers.

# SURFACE GRADER.

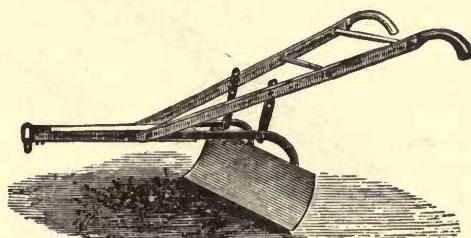


Fig. 1069.

This is intended for one horse only, and is used for removing the plowed ground from the sides of the road to the road-bed immediately opposite. It is worked by either backing the horse up to the place of filling or by crossing over from side to side, the driver retaining his load until the proper place is reached, or gradually losing it from beneath, as he may wish.

It is also of great service in grading and leveling off after the Scraper, leaving the road-bed level or rounded up, as desired. The beam is made of oak wood, and two substantial wrought-iron standards, as shown in cut above. The blade is of steel. It is light, but strong and durable.

Telegraph, Weep.

Price, \$9 00

# THE AUTOMATIC REVOLVING ROAD SCRAPER.

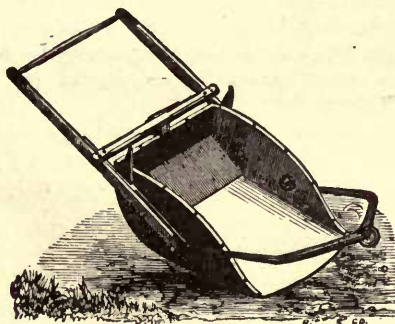


Fig. 1068.

30-inch steel bottom.	Telegraph, Well.	Price, \$18 00
33 " "	" Wert.	" 19 00
36 " "	" Wend.	" 20 00

In ordering these Scrapers, give name of "Revolving," to distinguish them from other Scrapers.

# ROAD LEVELER.

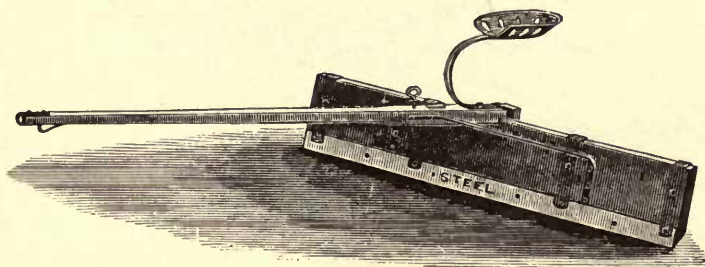


Fig. 1070.

For smoothing rough roads of any kind, dirt or gravel. Unsurpassed for use on turnpikes. It is largely used in the spring, when the frost is first out of the ground, and before the regular road work is done. By merely driving once or twice over the roughest roads the ridges are cut down, the ruts filled up, and the road-bed put in temporary good order. *It will pay for its cost in one day's use.*

Telegraph, Weed.

Price, \$12 00



## IRON ROAD SCRAPERS.

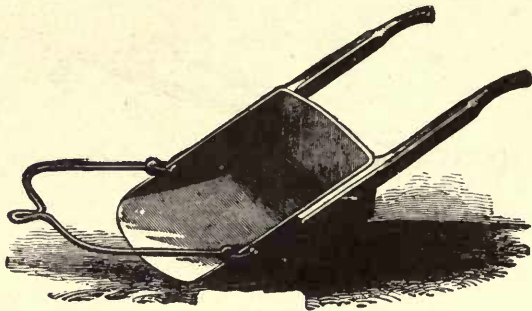


Fig. 1071.

No. 1.	24-inch.	Price, \$8 00	Telegraph, Wigwam.
" 2.	26 "	" 9 00	" Wild.
" 2½.	28 "	" 10 50	" Wimble.
" 3.	30 "	" 11 00	" Windfall.
" 4.	30 "	" 12 50	" Windlass.
" 5.	33 "	" 15 50	" Wine.

No. 4, 30-inch, is made very heavy for contractors.

## GARDEN ROLLERS.

WITH WEIGHTS TO KEEP HANDLE ERECT.

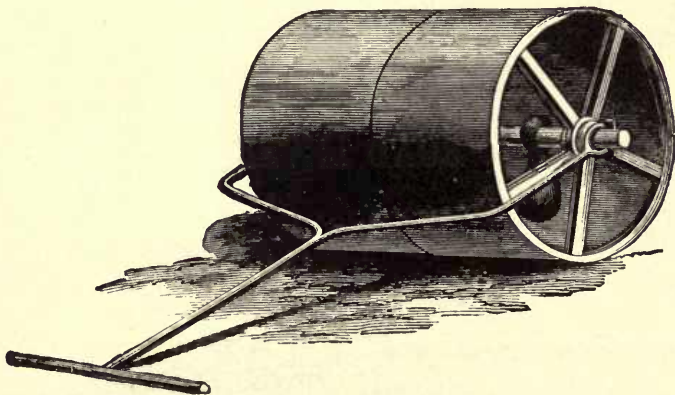


Fig. 1072.

Sections.	Face.	Diameter.	Weight about	Price.	Telegraph.
2	7½ in.	15 in.	125 lbs.	\$10 00	Whip
1	12 "	20 "	140 "	12 00	Whirl
1	20 "	20 "	220 "	16 00	Whirl
2	12 "	20 "	300 "	20 00	Whish
3	12 "	20 "	450 "	27 00	Whist
1	12 "	24 "	200 "	15 00	Whit
2	12 "	24 "	400 "	24 00	Wynkoop
1	12 "	28 "	250 "	18 00	Whiz
2	12 "	28 "	500 "	28 00	Wistar
3	12 "	28 "	700 "	42 00	Wield

## IMPROVED GARDEN ROLLER.

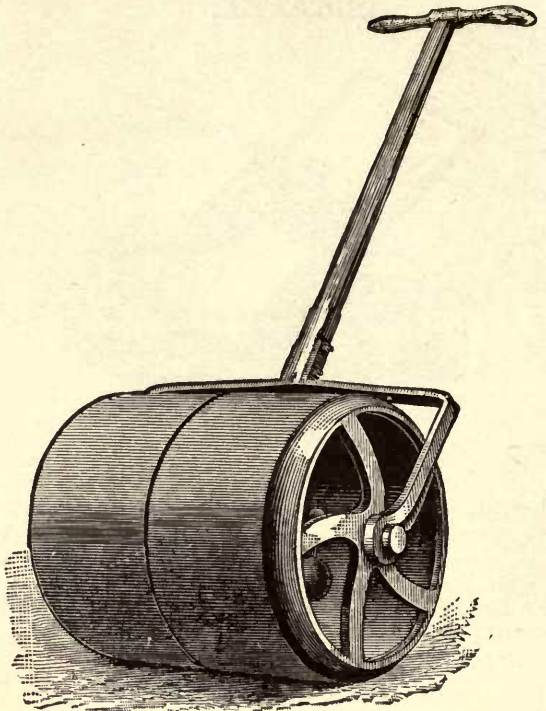


Fig. 1073.

We desire to call your attention to our Improved Garden Roller, illustrated above. Its advantages will strike you at once, and consists in rounding the outer edges of the Section to prevent dirt being thrown up in turning the roller round at the ends or corners of the plot to be rolled. In operating the old style it is necessary to keep the Roller rolling in a straight line, or the square outer corners will dig into the soil and throw up dirt sufficient to seriously interfere with the work already accomplished.

The wood handles are made from seasoned oak, and are preferable to iron in every respect. Upon the shafts are hung weights to keep the handles erect and give greater weight to the rollers.

No.	Sections.	Face.	Diameter.	Weight about	Price.	Telegraph.
1	2	12 in	20 in.	300 lbs.	\$22 00	Titus
2	3	12 "	20 "	450 "	29 00	Urban
3	2	12 "	24 "	400 "	26 00	Vernet
4	3	12 "	24 "	600 "	38 00	Victoria
5	2	12 "	28 "	500 "	32 00	Vigil
6	3	12 "	28 "	700 "	44 00	Uriah



SUPPLY DEPARTMENT—Continued.

FIELD ROLLERS.

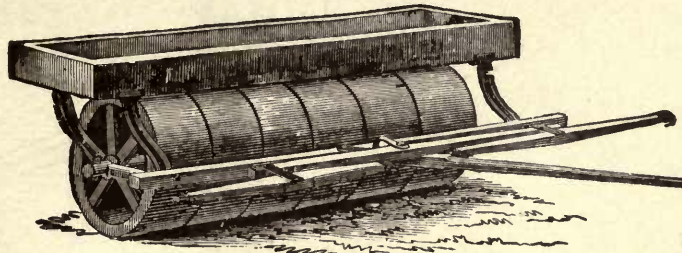


Fig. 1074.

The above cut represents the most approved Roller, constructed wholly of iron, except the tongue and box, which are of wood. The Rollers are made of various diameters, and in sections, revolving on a wrought-iron shaft.

Telegraph, Whig. Whiffletrees, extra, Price, \$5 00  
 " Whiff. Seat and Scraper, " 12 00  
 With Shaft or Pole same price.

Sec-tions.	Face.	Diameter.	Weight about	Price.	Telegraph.
3	12 in.	20 in.	750 lbs.	\$42 00	Whale
4	12 "	20 "	850 "	47 00	Wharf
5	12 "	20 "	1000 "	52 00	Wheat
4	12 "	24 "	1100 "	57 00	Wheel
5	12 "	24 "	1300 "	62 00	Wheeze
6	12 "	24 "	1600 "	72 00	Wheel
4	12 "	28 "	1200 "	62 00	Whelm
5	12 "	28 "	1450 "	72 00	Whelp
6	12 "	28 "	1800 "	82 00	Whet

FIELD ROLLERS.

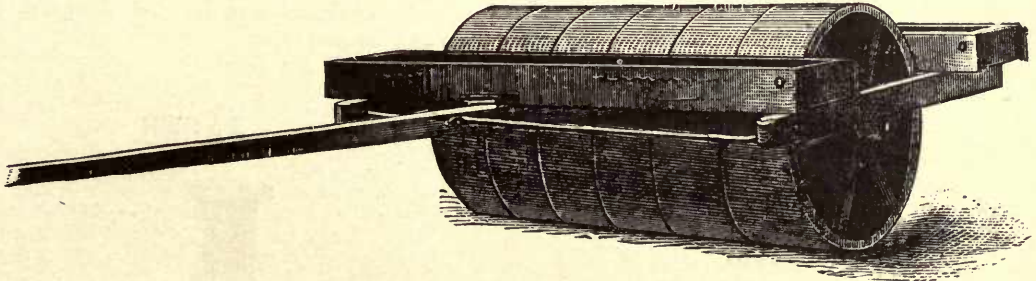


Fig. 1075.

Sec-tions.	Face.	Diameter.	Weight about	Price.	Telegraph.
4	12 in.	36 in.	1850 lbs.	\$ 92 00	Ralph
5	12 "	36 "	2300 "	112 00	Reuben
6	12 "	36 "	2800 "	142 00	Roderic

Telegraph, Water. Whiffletrees, extra, Price, \$5 00

ROAD ROLLERS.

No. 1076.

Sec-tions.	Face.	Diameter.	Weight about	Price.	Telegraph.
4	12 in.	36 in.	2500 lbs.	\$127 00	Rudolph
5	12 "	36 "	3000 "	152 00	Rodman
6	12 "	36 "	3500 "	177 00	Roger
3	15 "	48 "	3500 "	205 00	Rollo
4	15 "	48 "	4500 "	255 00	Roswell
5	15 "	48 "	5500 "	305 00	Royal
6	15 "	48 "	6500 "	355 00	Rufus
3	15 "	60 "	5500 "	280 00	Rupert
4	15 "	60 "	7500 "	380 00	Ryder
5	15 "	60 "	10,000 "	510 00	Romeo

Telegraph, Wax.

" Wavy.  
 " Weave.

Whiffletrees, extra, Price, \$7 00  
 Seat, " " 7 00  
 Scraper, " " 10 00

The 48-inch and 60-inch Rollers have poles arranged for double teams. All Road Rollers are fitted with steel shafts and are made any desired width and weight to order.



## SCREW JACKS.

(BELL BOTTOM.)

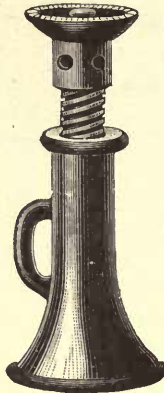


Fig. 1077.

## JACKS.

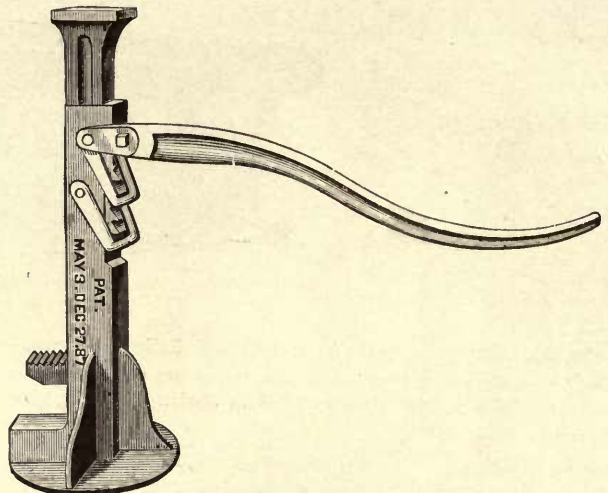


Fig. 1078.

Size.	Capacity.	Price.	Tel.
No. 2.	2 tons	\$6 00	Harmonize
" 3.	3 "	8 00	Harmony

Jack No. 2 is made entirely of a superior quality of Air Refined Malleable Iron. It stands 16 inches in height, with a raise of 10 inches, and weighs complete 22 lbs. Jack No. 3 is the same as No. 2, except that it has steel links.

Size,	Diameter of Screw,	Length of Iron Barrel,	Price.	Tel.
No. 1.	2 1/2 in.	24 in.	\$13 00	Guzzle
" 2.	2 1/2 "	20 "	11 00	Gype
" 3.	2 1/2 "	16 "	9 50	Gye
" 4.	2 1/2 "	14 "	9 00	Guy
" 5.	2 1/2 "	12 "	8 50	Gib
" 6.	2 1/2 "	10 "	8 00	Gop
" 7.	2 1/2 "	8 "	7 50	Gall
" 8.	2 1/4 "	24 "	12 00	Gun
" 9.	2 1/4 "	20 "	10 00	Habit
" 10.	2 1/4 "	16 "	9 00	Hack
" 11.	2 1/4 "	14 "	8 00	Hackney
" 12.	2 1/4 "	12 "	7 50	Hadder
" 13.	2 1/4 "	10 "	7 00	Haddock
" 14.	2 1/4 "	8 "	6 50	Hade
" 15.	2 "	24 "	10 00	Hag
" 16.	2 "	20 "	8 00	Hail
" 17.	2 "	16 "	7 00	Hake
" 18.	2 "	14 "	6 00	Half
" 19.	2 "	12 "	5 25	Hamlet
" 20.	2 "	10 "	4 75	Halloo
" 21.	2 "	8 "	4 25	Halter
" 22.	2 "	6 "	4 00	Halve
" 23.	1 3/4 "	16 "	5 90	Harier
" 24.	1 3/4 "	14 "	4 75	Ham
" 25.	1 3/4 "	12 "	4 50	Hardy
" 26.	1 3/4 "	10 "	4 00	Hame
" 27.	1 3/4 "	8 "	3 75	Hammer
" 28.	1 3/4 "	6 "	3 25	Hawkins
" 29.	1 1/2 "	12 "	4 00	Harbor
" 30.	1 1/2 "	10 "	3 75	Hard
" 31.	1 1/2 "	8 "	3 50	Hezekiah
" 32.	1 1/2 "	6 "	3 00	Hardship
" 33.	1 1/4 "	8 "	3 00	Hardspun
" 34.	1 1/4 "	6 "	2 50	Hardware

## JACKS.

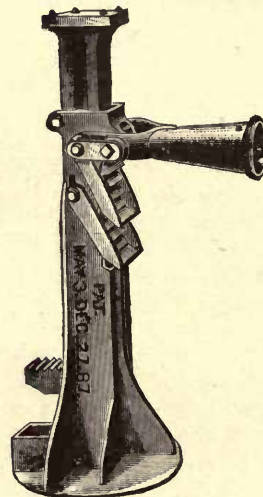


Fig. 1079.

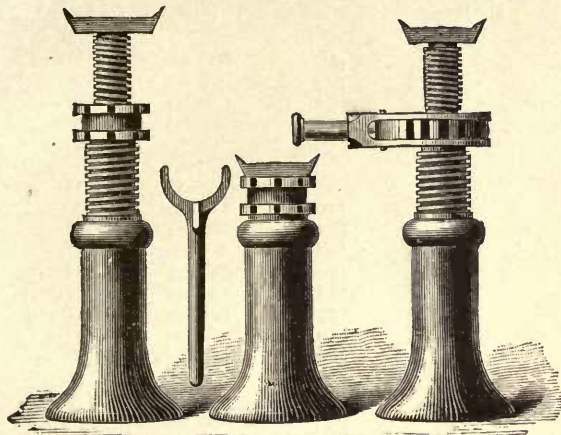
Size.	Capacity.	Price.	Tel.
No. 4.	4 tons	\$12 00	Haste

This Jack is made of Air Refined Malleable Iron, with exception of links, which are made of steel. It is generally used for lifting heavy boilers, engines, and machinery, and for handling safes and monumental work. It is absolutely indispensable for truckmen, masons, and track-work, and the price is within the reach of all.

Height of Jack when bar is down, 21 inches, rise of bar, 10 inches; size of bar, 1 1/2 inches; weight of Jack, 35 lbs.



## BALL'S PATENT TELESCOPIC JACK SCREWS.



No. 1.

Fig. 1080.

No. 2.

Size	Height of Base.	Height Closed	Net Rise	Total Height	Price No. 1	Price No. 2	Tel.
No. 1	7½ in.	10 in.	11 in.	21 in.	\$15 00	\$25 00	Unquiet
" 2	10 "	14 "	16 "	30 "	18 00	30 00	Unreal
" 3	13½ "	17 "	23 "	40 "	22 00	32 00	Unravel
" 4	18. "	21 "	31 "	52 "	25 00	35 00	Unripe
" 5	22 "	25 "	36 "	61 "	30 00	40 00	Unroll

For No. 2 Jacks prefix R to the corresponding telegraph name, viz.: R Unquiet.

These Jacks consist of two wrought-iron screws, one working within the other, operating simultaneously. By this method of construction the screws can be run out nearly double the height of the base, and will raise a load in one-half the time required by the ordinary Jack without increasing the labor.

They have been in use for several years, are highly approved of by the principal railroad companies throughout the country, and are acknowledged by all to be the best Jacks now made. They are the shortest and also the longest Jacks in use, and weigh less than any others of corresponding capacity.

Number 2 represents the "TELESCOPIC JACK," with a ratchet lever. This improvement makes it the most desirable Jack in use, being much cheaper than any made with the same length of screw.

## CAR BOX JACK.



Fig. 1083.

Size. No. 1.	Diameter of Screw. 2¼ in.	Height over all 11 in.	Price. \$6 00	Tel. Guze
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## CLAW JACKS.

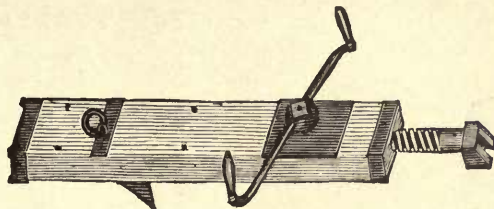


Fig. 1081.

Size	Length of Screw		Size of Screw	Price	Tel.
No. 1	24 in.	Comp. Gear.	2 in.	\$20 00	Unsay
" 2	30 "	" "	2 "	22 00	Unseal
" 3	33 "	" "	2 "	23 00	Urge
" 4	36 "	" "	2 "	24 00	Urbane
" 5	33 "	" "	2¼ "	29 00	Urchin
" 6	36 "	" "	2¼ "	32 00	Urn
" 7	42 "	" "	2¼ "	36 00	Usage
" 8	36 "	" "	2¾ "	50 00	Usable
" 9	42 "	" "	2¾ "	55 00	Usual
" 10	48 "	" "	2¾ "	60 00	Usher

## COTTON SCREWS.

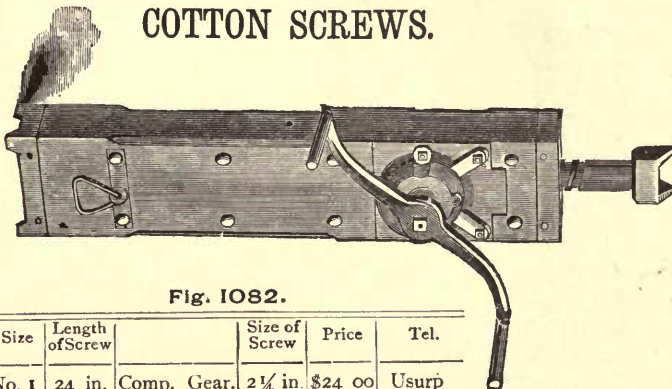


Fig. 1082.

Size	Length of Screw		Size of Screw	Price	Tel.
No. 1	24 in.	Comp. Gear.	2¼ in.	\$24 00	Usurp
" 2	30 "	" "	2¼ "	25 00	Usury
" 3	36 "	" "	2¼ "	26 00	Utilize
" 4	42 "	" "	2¼ "	28 00	Utmost
" 5	36 "	Steel	2¾ "	45 00	Utterly
" 6	42 "	" "	2¾ "	48 00	Upturn
" 7	48 "	" "	2¾ "	52 00	Undine

## CHAIN.

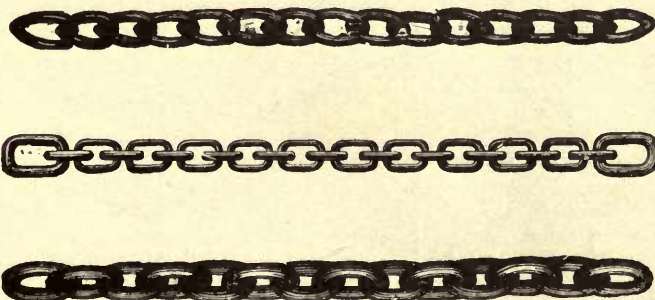


Fig. 1084.

The best material being used and skilled workmen employed in the manufacture of the chain sold by us, we can and do guarantee it in every respect.

Made in sizes from 3-16 to 1¼ in., and larger.

Prices, per lb., on application.

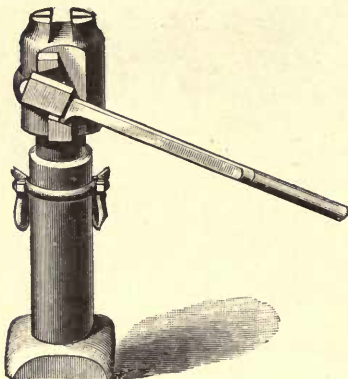


# RIEHLÉ BROS. TESTING MACHINE CO., PHILADELPHIA.

## SUPPLY DEPARTMENT—Continued.

### HYDRAULIC JACKS.

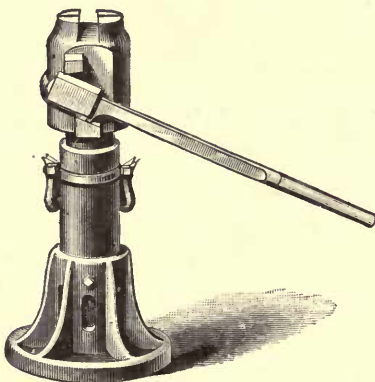
#### PRICES OF PLAIN HYDRAULIC JACKS PER FIG. 1085.



PLAIN JACK.  
Fig. 1085.

Size.	Capacity, Tons lift.	Run out.	Height, Inches.	Size bottom.	Weight, lbs.	Price.	Tel.
No. 1	4	12	24	4 sq	46	\$60 00	Heptine
" 2	4	24	37	4 "	60	65 00	Hence
" 3	7	12	25	4½ "	64	70 00	Hende
" 4	7	18	32	4½ "	72	73 00	Hennes
" 5	7	24	38	4½ "	80	75 00	Hent
" 6	10	12	25	6 "	80	80 00	Hepatic
" 7	10	18	32	6 "	98	95 00	Herb
" 8	10	24	39	6 "	110	110 00	Herod
" 9	15	12	26	6½ "	102	100 00	Herbage
" 10	15	18	32	6½ "	120	125 00	Her
" 11	15	24	39	6½ "	140	150 00	Herald
" 12	20	12	26	7 "	127	120 00	Herber
" 13	20	18	33	7 "	155	145 00	Heron
" 14	20	24	39	7 "	180	170 00	Heresy
" 15	30	19	22	8 rd	146	150 00	Here
" 16	30	12	26	8 "	194	175 00	Herd
" 17	30	18	33	8 "	260	210 00	Hereford
" 18	40	12	27	9 "	280	210 00	Heric
" 19	40	18	34	9 "	320	250 00	Hermitage

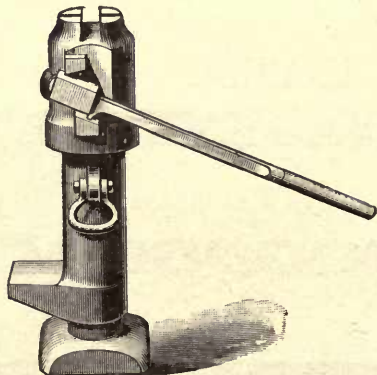
#### PRICES OF BASE HYDRAULIC JACKS PER FIG. 1086.



BASE JACK.  
Fig. 1086.

Size.	Capacity, Tons lift.	Run out.	Height, Inches.	Size bottom.	Weight, lbs.	Price.	Tel.
No. 20	4	12	23	9½ rd	61	\$60 00	Hero
" 21	4	24	37	9½ "	80	65 00	Hirundo
" 22	7	12	25	10 "	82	80 00	Hessian
" 23	7	18	31	10 "	100	85 00	Hess
" 24	7	24	38	10 "	120	90 00	Hessite
" 25	10	12	25	11 "	109	95 00	Halifax
" 26	10	18	31	11 "	125	110 00	Hesperis
" 27	10	24	39	11 "	145	125 00	Hexone
" 28	15	12	25	12 "	135	125 00	Heyday
" 29	15	18	32	12 "	158	150 00	Heyne
" 30	15	24	39	12 "	176	175 00	Hibernal
" 31	20	12	26	13 "	169	150 00	Higo
" 32	20	18	33	13 "	198	175 00	Highth
" 33	20	24	39	13 "	228	200 00	Hile
" 34	30	9	22	14 "	210	170 00	Hill
" 35	30	12	26	14 "	259	200 00	Hull
" 36	30	18	33	14 "	300	235 00	Hinder
" 37	40	12	27	14½ "	320	240 00	Hiltop
" 38	40	18	33	14½ "	360	280 00	Hilted

#### PRICES OF CLAW OR GROUND LIFTING HYDRAULIC JACKS PER FIG. 1087.



CLAW OR GROUND LIFTING JACK.  
Fig. 1087.

Size.	Capacity, Tons lift.	Run out.	Height, Inches.	Size bottom.	Weight, lbs.	Price.	Tel.
No. 39	4	12	24	4 sq	64	\$60 00	Horatio
" 40	4	24	37	4 "	94	65 00	Hirudo
" 41	7	12	25	4½ "	90	85 00	Hog
" 42	7	18	31	4½ "	110	88 00	Hod
" 43	7	24	38	4½ "	123	90 00	Hocus
" 44	10	12	25	6 "	123	100 00	Hocie
" 45	10	18	32	6 "	144	120 00	Hobnob
" 46	10	24	39	6 "	170	145 00	Hobnail
" 47	15	12	26	6½ "	162	150 00	Hoecake
" 48	15	18	32	6½ "	189	185 00	Hominy
" 49	20	12	26	7 "	207	200 00	Homish
" 50	20	18	33	7 "	245	240 00	Holy
" 51	30	12	26	8 rd	310	250 00	Holpen

#### SPECIAL SIZES TO ORDER.

The ground lifting attachment is a tube screwed in to the underside of the head, on the lower end is a claw to support the weight to be raised. These Jacks appear to the eye when depressed a simple Cylinder, with a Base and Head, when elevated one Cylinder sliding within another. To the inner one (which is termed the Ram) is attached the Head having a socket to receive the Lever which operates the Force Pump in the lower end of Ram; the remaining space is the reservoir containing the liquid which when forced into the lower chamber causes the Ram to rise, and to lower, when allowed to return through the lower valve and back passages operated by the same lever. These Jacks are light, portable and easy of application, worked by one man who can lift 10 tons, 1 foot in 1½ minutes or 20 tons in 3 minutes and so on proportionately.



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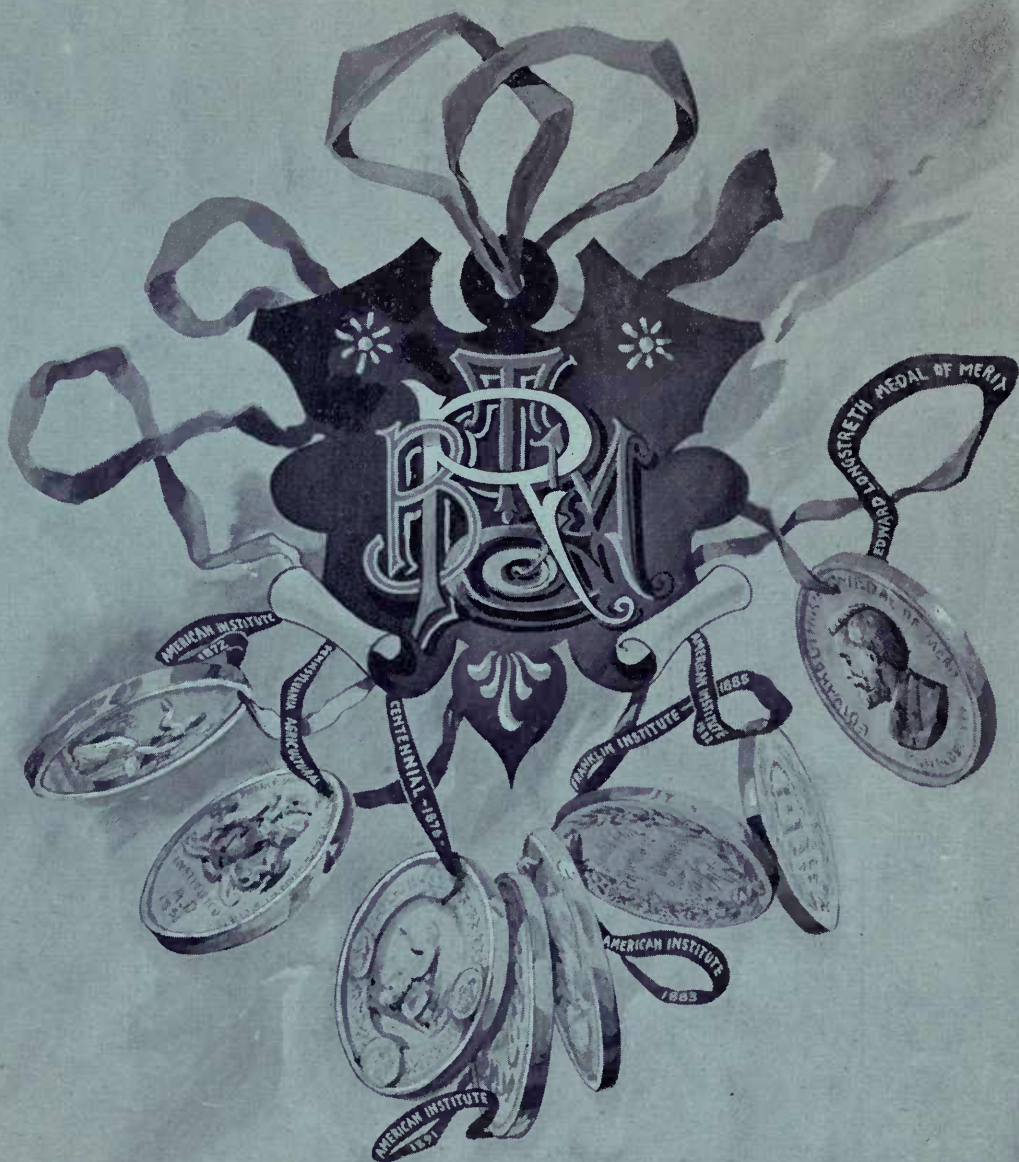


















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